DISPUTES OVER SHARING OF TRANSBORDER RIVERS IN WEST ASIA

ABSTRACT
THESIS

SUBMITTED FOR THE AWARD OF THE DEGREE OF

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IN

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(GEOGRAPHY)

BY

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"DISPUTES OVER SHARING OF TRANS BORDER RIVERS IN WEST ASIA"

ABSTRACT

West Asia is a developing region and water scarcity is not a new phenomenon in the region. It is one of the most important basic resources of our world. It is a life sustaining resource and without it no living thing, plant or animal, can exist. It is required in abundance not only to quench our thirst and meet our domestic needs but to maintain the socio-economic development. While demand for water is rapidly increasing in West Asia; the supply of fresh water is finite. As a result, in West Asia it is one of the most sensitive political issue, the situation is getting worse and the shortage of water is approaching crisis levels.

The problem is further exacerbated by the fact that most of the waters in West Asia are transboundary that crosses or spans an international border. Indeed, the lack of water, or access to it, has often led to serious armed conflicts.

It is clear that differences of opinion over the use of river water in West Asia is one of the most important active issues in regional politics, both overtly and covertly. Overtly, we can see the issue clearly when agreements are signed or complaints filed with the United Nations or when a military threat is felt. Covertly, the river waters can be seen as an important strategic factor when states in the region consider political water as a natural security factor and this political maneuver influence the development of the river systems. The major rivers of the region are: the Jordan, the Euphrates-Tigris, and the Nile.

West Asia is generally known as a water deficit region in the world. The problem attendant to water scarcity is particularly acute in the West Asia, as the region has one of the fastest growing populations. Water may be more important than either oil or politics, where as

proven oil reserves in the area are estimated to last at least 100 years, water supplies are already insufficient throughout the region, and competition for it is inevitably going to increase in the years ahead. In addition, there are number of rivers in this region that traverse international boundaries established during the twentieth century, and that have become a focus of interstate tension.

The factors that determine the fair division of International River Water are the Geography of the drainage basin; its climate and hydrology; past and present use of basin water; economic and social needs of the basin riparian states; the degree of dependency on the river water; the cost of alternative projects for water use; the existence of resources other than water; the no wasteful use of basin water; and the possibility of providing compensation for damage caused.

The most regions of the world hydrograph are largely controlled by rainfall, with landforms and geological structure as subsidiary factors. As the result of a generally deficient rainfall, however, the West Asia shows to an unusual degree of the influence of topography and structure in the development of its river systems. The climatic condition of West Asia varies as the region is large extends over many latitudes, and exhibits great physical diversity. In most of the West Asian states climate is harsh and arid with scanty rainfall and very high potential of evaporation except in the coastal and mountainous regions.

At the most basic level, actual scarcity may be said to exist when real demand exceeds real supply. Although the maxims of supply and demand may determine actual shortages, the concept of water scarcity encompasses many discrete but interrelated factors that govern supply for any given demand: climate, perceived and real need, quality, location and reliability of source, consumption, technical capacity, accessibility, demographic growth patterns, distribution of population and water resources, efficiency, organization and management, use of fertilizers, loss and waste, stocks of water and policy decisions on the rate of consumption and distribution. Perceptions of the amount and quality and availability of water are usually a part of a people's attitude toward the environment.

The region has very little margin of safety where water supply is concerned, especially given a population that is projected to double within the next quarter century. Unless this situation is reversed without further delay, several key actors in the major River Basins- Jordan, Israel, the Occupied Territories, Egypt, Turkey Syria, and Iraq- face a series of destabilizing economic and political crises with the foreseeable future, the consequences of which will reverberate throughout the region and in much of the western world. Scarcity, especially mismanaged scarcity combined with uneven distribution contributes significantly to the creation of an environment of uncertainty and instability in the basic political, economic, and social institutions of society, most destructively in situations where the reciprocal factors of ecological marginality and rising poverty obtain-a condition that characterizes most Arab countries.

The most limiting characteristic in the agriculture of the region is the lack of water. Throughout most of the region rainfall is seasonal, mostly in the winter although in southern Arabia and the Sudan there is summer monsoon rainfall. Only in northern Turkey and northern Iran is there year round precipitation.

Several of the states in West Asia have become entirely dependent upon imported food, a situation from which they would prefer to be freed by means of planned agricultural development. One result has been that food imports have increased government control over strategic urban food supplies.

Disputes over the distribution of the waters of International Rivers are a frequent phenomenon of the present century, and stem from efforts by riparian countries to control the natural flow of water with the help of modern technology. They also arise from endeavours to secure greater exploitation of water resources. There have been bilateral and even multilateral treaties to resolve such disputes, but so far no set system of International Law on water resources has been evolved.

The use of joint river systems and the utilization of their waters is particularly complex from a legal standpoint. International Law with respect to water provides a poorly developed framework for international discourse and for the foreseeable future the legal arguments will be subordinate to political considerations. International Law is also ambiguous, in for example the interpretation of the principle of 'no harm'. A state's territory undoubtedly includes the water flowing through it, "national waters", but national waters, flowing in rivers, may reach the territory of another state, becoming the national waters of that state. Water, being part of the territory, but temporary and flowing, makes the definition of the concept "territory" problematic, and raises complex questions in international law. When "unfair" use of river water is made by other states, International Law refers to this as "destructive use". "Destructive use" can be caused by a change in the flow of the river in such a way that the water is not returned to the existing system for the use of others.

The Jordan River is the major source of water in Jordan basin. It is the third largest perennial river in West Asia. The Jordan River is a multinational river. It has four riparian states: Israel, Jordan, Syria and Lebanon. The length of the Jordan River is 320 kilometer of which 73 kilometer is under Israeli occupied territory and the remainder in Syria, Lebanon and Jordan.

It is also the most frequently cited case among all the water system in West Asia as a source of serious conflict. The Jordan basin includes Israel and the occupied territories-West Bank, Gaza Strip and Golan Height-Jordan and south western Syria. This region faces the most serious water deficit in West Asia and there is an urgent need to define a mutually acceptable framework of water management.

The disputes relates to the sharing of the surface water of the Jordan River basin between Israel, Jordan, Lebanon, Syria and the Palestinians of the West Bank. In addition on the already complicated issues in any transboundary water dispute, these disputes also involve extremely complex political and territorial issues. The history of these disputes involves, not surprisingly, both armed conflict and peaceful negotiation.

The Jordan River system has witnessed more severe international conflict over water than any other river system in the West Asia. While one can expect gradually increasing tension over the Euphrates and perhaps even the Nile, by far the most likely flashpoint for water conflict in the West Asia, today and in the near future, remains the Jordan. The fundamental reasons for this are two. There has been no significant reduction in the extremely high level of general international tension and hostility in the area- if any thing, probably the contrary. The water situation has progressively deteriorated as both Israel and Jordan are moving into full use and then into shortage conditions. Slack in the system has almost disappeared, with the result that conflicts over water resources become increasingly zero-sum and exacerbated.

History and experience in this water-scarce basin demonstrate that sustainable solutions to water problems, whether domestic or international, always require cooperation, equitable sharing, and efficient utilization among involved parties.

However, the complex environmental and hydrological issues cannot be resolved by political formulas negotiated by diplomats alone. The tasks of environmental rehabilitation and particularly of water resource development and efficient utilization require a considerable investment of capital.

The case of the river Jordan is unique in words hydropolitis and geopolitics owing to the combination of a small quantity of water and a large number of partners among whom there exists a prolonged and very serious conflict. Failure to find a solution to this problem could be a cause of internal stability or under mind international agreements that have been achieved by the countries of the area. Hence there is an urgent need to enhance water supply in the region. There are many ways of increasing a countries water supply, a part from building more dams digging more wells or bring waters from other river basins. The increasing environmental averness in the region has highlighted the fact that since war can not change the ecological givens, it could not increase the water supply in real terms and in the long runs the cost of war would far exceed the possible return. Further more the historical background of water management policies in the region indicates that the indigenous inhabitant of the West Asia have always been aware that cooperation between riparian parties over shared water resources is the only way to create a win situation in which all parties are better off. The scarcity of water therefore though it might cause periodic tensions does not encourage states of the region to employ violence to resolve the problem. Indeed there is considerable evidence indicating that hydrilopolitic in West Asia is a contest for cooperation in which the development of common water resources will create a network of collective interest and a platform for a common perceptions that will finally breed more regional instigations and peace full coexistence.

Of the three riparian in the Euphrates-Tigris River Basin-Turkey, Syria and Iraq-Turkey is in the most advantageous position. It has several relatively abundant rivers and enjoys the greatest waters endowment relative to demand. It is economically and militarily the most powerful state in the basin region and enjoys the status of being the upstream state. Both downstream states have extensive desert and semi-desert composing about one half the land area of Syria and two third of Iraq. The Euphrates accounts for the major source of surface water to Syria, the midstream riparian. As for Iraq, the furthest downstream, agriculture in all but the northern portion of the country is heavily dependent on water from both the Euphrates-Tigris River.

The water resources have never been the root cause of military conflict in Mesopotamia and, second, since antiquity, hydraulic civilizations which flourished in the Euphrates-Tigris basin have been forced to cooperate and coordinate their collective efforts in a systematic way in order to control the two mighty rivers for the sake of all beneficiaries. This argument is supported by several hydrological and historical facts.

- First the annual discharge of the two rivers has been more than enough to provide for the needs of all riparian communities.
- Second according to archaeological evidence, the hydraulic civilizations of Mesopotamia not only invented the most suitable tools for efficient water utilization such as the wheel, windmill, and pipe, but also developed a remarkable water management system, through extensive networks of dikes, canals and reservoirs.
- Third these civilizations had the social prowess and well-established legal institutions required for maintaining the functionality of their organized water systems and preventing conflict.

Despite recent alarmist warnings by commentators and their conflict representation of hydro politics in the Euphrates-Tigris basin, in marked contrast to the Jordan River basin, none of the riparian countries is facing an imminent water shortage.

There has been no military conflict between the three riparian states of the Euphrates-Tigris basin and no violent water conflict has marked their relationship. Indeed, the three parties have been engaged in a continuous, active, and critical dialogue and technical consultations since the early 1960s.

Analysis of water diplomacy in Mesopotamia indicates that there are several factors which strongly militate against the outbreak of conflict in the future.

- First, the actual water demand of all three riparian countries in the foreseeable future will be less than originally projected.
- Second, the desire to solve the problems of water logging and saline deposit will encourage the adoption of more efficient patterns of water utilization and new water-saving irrigation techniques and technologies.
- Third, the ability of Iraq to transfer the Tigris water to relieve any contingent shortage in the Euphrates is a comforting alternative.
- Fourth, consultations are continuing among the riparian states in the Joint Technical Committees, reflects a cooperative trends among the three riparian states.
- Last but not least, as a result of the UN Convention on the Law of the Non-navigational uses of International Watercourses, the parties have recognized that they have to shift their water disputes from contests of power to considerations of fair rights and mutual obligations.

These considerations effectively undermine the likelihood of military conflict between Turkey, Iraq, and Syria over water issues and nullify the fanciful scenarios of water war in this basin posed by many writers. We must now turn our attention to the Arabian Peninsula, in which hydro politics has a very different setting, not least because the scarcity of water is a major fact of life.

GAP, initiated in 1965, is Turkey's largest and most ambitious development project in the south-eastern part of the states. It has been conceived and implemented as a means of integrating water resources development with overall human development in one of the backward regions of Turkey. The project area lies in south eastern Turkey, covering nine provinces corresponding to approximately 10 percent of Turkey's total population and an equivalent surface area. The project area includes the watersheds of the lower Euphrates and Tigris rivers and the upper Mesopotamian plains. The water resources development program of GAP includes 13 groups of irrigation and energy projects, seven of which are on the Euphrates River and six on the Tigris. The project includes 22 dams, 19 hydropower plants, and irrigation networks, on the Euphrates and Tigris river basins, to irrigate 1.7 million hectares of land.

The Nile is an important West Asian river although all its waters come from tropical equatorial Africa. The provenance of the water means that an understanding of the past, current and future water resources of Egypt and the northern Sudan require that the hydrology of the southern, water generating part of the system. The Nile is the longest river in the world, has shaped the culture of Egypt over the millennia. By the time its major tributaries join at Khartoum the flow is about 84 cubic kilometers per year. The Nile River is 6,825 kilometer long over 35 degrees of latitude until it reaches the Mediterranean and its catchments basin covers over three million cubic kilometer. The Nile and its tributaries bring to gather ten riparian states: Burundi, the Democratic Republic of the Congo, Egypt, Eritera, Ethiopia, Kenya, the Sudan, Rawanda, Tanzania and Uganda.

Egypt has historical rights to use Nile water since the start of human civilization. Sudan also has historical rights, less than Egypt but more than the upstream states, which began using Nile water only recently. Egypt and Sudan are the only users of the river water. The beginnings of a crisis have materialized along the Nile as well. Ethiopia, making movements toward state building for the first time in a generation following the overthrow of the communist Mengistu regime in 1991, has focused upon water distribution as an issue of paramount concern. The North African country, currently ravaged by conflict with

Eritrea, possesses neither the economic stability nor the investor confidence to facilitate desalination efforts. Consequently, Ethiopia has increasingly objected to the water use of neighboring Egypt, claiming present allocation-regulated by a 1959 agreement over Nile and Sudan as arbitary, Ethiopia has hinted it may resort to a unilateral exercise of sovereignty or a military confrontation with Egypt. All the basin states of the Nile are dependent on agriculture, which is their principal source of income. Egypt is less dependent on agriculture than the others because it has other sources of income, but it is more dependent on river water than the other.

All the countries in the region are considered to be developing states in socioeconomic terms. In all of them the natural growth rate population is high and they cannot match it with agricultural development, and they all import a large part of their food. The accords signed by Ethiopia and Sudan in 1991 and by Ethiopia and Egypt in 1993 also suggest that discussion and negotiation are more likely than war. Of course, there is a great distance to travel between these general declarations of intent and a new apportionment of the Nile waters that take Ethiopian requirements into account, let alone the cooperative management of the basin as a whole. The current hostility between Egypt and Sudan is a major obstacle to progress.

In the case of international law, water of common interest, the most helpful evidence of this practice is to be found in a number of bilateral treaties and certain multilateral treaties and conventions. In international Law, a distinction is normally drawn between national and international rivers. A river, which passes through or along the territory of two or more states is described as International River and is governed by the rules of the International River Law.

The utilization of the waters of an international drainage basin raises many problems with respect to both International Relations and International Law. Water rights have been the subject of state concern ever since the earliest appearance of any form of state organization. In the light of the most recent research it may not even be going too far to organization.

It is an assumption of International Law that the allocation of scarce resources requires legal adjudication if conflict is to be avoided. International Law recognizes the community of property among riparian states as a customary rule of law, that is, each of them is entitled to use a share of the river so long as unreasonable injury to another riparian does not ensue. Although this principle has been upheld in the courts, it contains an inherent weakness and has also been challenged by countervailing legal arguments. The flaw slies in the fact that customary rules tend to be highly unstable unless all involved parties have compatible interests, preferably guaranteed by formal agreement. International law has recognized that a river is the property of the community of all riparian states and this has been followed by recognition of the existence of certain limitations to territorial sovereignty in favour of the international community in general. However, the first step toward translation legal theory into institutional application is the production of political agreements. Such facts are essential to the creation of a broader array of legal instruments for solving international disputes over shared water resources.

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2010

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Date : 20.03.2010

Certificate

This is to certify that the Ph.D. thesis on ***"Disputes Over Sharing of Transborder Rivers in West Asia"*** submitted by **Miss. Ghazzala Shabbana** is her own original contribution and suitable for submission for the award of the degree of Ph.D.

Further certified that **Miss. Ghazzala Shabbana** has been engaged in full-time research and that she has put in required attendance as prescribed by the University.

(Dr. Fazal Mahmood)
Supervisor

(Prof. Mohammad Gulrez)
Chairman

Declaration

I solemnly declare that the research work incorporated in this thesis entitled ***"Disputes Over Sharing of Transborder Rivers in West Asia"*** for the degree of **Doctor of Philosophy in West Asian Studies (Geography)** submitted to the Centre of West Asian Studies, Aligarh Muslim University, Aligarh is an original work and has been undertaken by me under the supervision of **Dr. Fazal Mahmood** (Associate Professor).

I also declare that neither full nor a part of this work is published anywhere in any form.

Ghazzala Shabbana

(Ghazzala Shabbana)
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Aligarh Muslim University
Aligarh

Dedicated

to

My Most Loving Parents

CONTENTS

PREFACE

Water is the most precious and limited natural resource in West Asia. Water is one of the most important basic natural resources for socio-economic. Without it no living thing, plant or animal, can exist. Some times during the year, it is in plenty and at other times becomes scarce.

West Asia is a developing region and water scarcity is not a new phenomenon in the arid region. In most of the West Asian region climate is harsh and arid with scanty rainfall and very high potential evaporation except in the coastal and mountainous region. While demand for water is rapidly growing in West Asia, the supply of fresh water is limited. As far as an arid region is concerned typical war is generated by increasing competition for water combined with problems of water shortage during the dry with problems of water shortage during the dry seasons.

The situation is likely to deteriorate even further in the future for important reasons. The global population is increasing rapidly, and is likely to continue to do so still about the year 2050, or even beyond. This means more and more water would be required for domestic and industrial uses, agricultural production and hydropower generation for this expanding population. As more and more people attain a higher standard of living, per capita water demand would continue to increase as well. Current analyses indicate that the total global water consumption during the period 2010-2050 is likely to increase fifteen fold and this trend is likely to extend well into the second half of the present century. There are numerous reasons for water scarcity such as climate variations, degradation of water quality by human activity at a rate faster than the source can be renewed, depletion of a source, such as an aquifer, at a rate faster than it can be replenished, out of basin diversion or storage of surface water, redistribution for other uses or to another place, and consumption. They all tend to the variations, which taken together, will delimit supply and demand.

Disputes over the distribution of the waters of international rivers are frequent phenomenon of the present century and stem from efforts by riparian countries to control the natural flow of water with the help of modern technology. The use of river water in West Asia is one of the most important active issues in regional politics, both overtly and covertly. Overtly, we can see the issue clearly when agreements are signed or complaints filed with the United National or when a military threat is felt.

The recent studies and reports describe a grim picture of fresh water availability in the West Asia, indicating that there is a significant risk of imminent conflicts and wars over water in this region.

The purpose of this study is an inquiry into the conduct of riparian states in transnational river basins of the West Asia, based on an analysis of the actual needs of the countries bordering these basins and the political implications of the unevenly distributed region's water resources. It seeks to find out the obstacles which have prevented the countries of the region reaching a cooperative basin-wide arrangement, which is the optimal method for development and exploitation of their common water resources. The scope of concern includes both the transnational rivers and the cross-border aquifers in the West Asia where, because of the aridity of the climate and the high rate of population growth, unimpeded access to freshwater resources is linked to national survival.

The significance of this study lies in its endeavour to define the limitations and opportunities for the achievement of cooperation solutions to the problem of managing a common property resource and to avoid both the 'tragedy of the commons' and regional violence. The main objective is to put forward an interpretation of water, politics in which water is seen as a critical factor in many countries toward cooperation rather than military conflict with their co-riparian neighbours. It will show that although water has occasionally provoked dispute in the west Asia, it has much more often promoted coexistence between adversaries. The main hypothesis is that, contrary to the most frequently mentioned scenario in the literature that suggest that dispute over water supplies will lead to interstate war, it is unlikely that the quest for more water will cause a new war in the West Asia. Rather, water shortage should be seen as a platform for regional cooperation that promises development and exploitation of the region's water supplies in ways that all riparian nations can achieve optimal solutions. Moreover, joint cooperative development of common water resources will actually reinforce peace.

The primary concern in the present in the present study is to develop a conceptual frame-work in connection with rivers water allocation among riparian states. The focus of this study is on three rivers. These rivers are the Jordan, the Euphrates, and the Nile rivers. It is these three rivers which have been the centre of acute controversy since the Second World War. All rivers have perennial water course in semi desert land and as such they assume importance far out of proportion to their modest discharges. Dispute over allocation of water has blocked cooperative efforts to solve the problem and the perpetual interference of great powers in the region has made these issues more complex and intractable.

The Thesis is divided into seven chapters :

The **first chapter** deals with the significance of the study and literature review. It also explains the objective of study and methodology of the work.

The **second chapter** begins with discussion of the geography of the West Asian region as a whole, including a brief historical review of the background to and origin of the disputes and domestic water use in urban areas, irrigation and water requirement and what is water sharing Disputes?

The **third chapter** highlights the Trans-boundary regional disputes over the Jordan River, it's climatic and hydrolopolitical features. The chapter also explains the disputes related to the sharing of the surface water of the Jordan River Basin between Israel, Jordan, Lebanon, Syria and Palestine. In the end the chapter provides some negotiations and treaties to settle down these disputes.

The **fourth chapter** deals with the Disputes and agreement over the Euphrates-Tigris Rivers. The study provides a review of the hydrology of the river and the river's relevance to the economies of its three riparians. This resources profile is the basis of the analysis of the strategic role of the river in the relations between Turkey, Syria and Iraq. The three riparians began to plan and carry out extensive development programmers for the Euphrates river water by constructing dams whose main purpose was to control the flow of its water, for the production of hydroelectric power and for agricultural purposes. These programmers caused tension in the foreign relations between the countries.

The **fifth chapter** discusses the conflicts relating to the sharing of the Nile River between Egypt, the Sudan and Ethiopia. The building of the Aswan High Dam, in Egypt and its epicureans on the utilization of water on the riparian states in the focus of this chapter.

The **sixth chapter** analyses the role of International Laws and treaties and the extent of their applicability to the problem of water sharing of transnational rivers in West Asia.

The **last chapter** is suggestion and conclusion of the entire study. It also highlights solution proposals in consonance with the situation obtaining at present.

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LIST OF ABBREVIATIONS

ADB	African Development Bank
AOAD	Arab Organization for Agricultural Development
APEC	Asia Pacific Economic Cooperation
AQUASTAT	Water resources database compiled by FAO
BCE	Before Christian Era
CIS	Central Intelligence Agency
DSI	Devlet Su Islerl (The General Directorate of state water works)
EIB	European Investment Bank
EOSAT	Earth Observation Satellite Company
EAP	Environmental Protection Agency (USA)
EU	European Union
FAO	Food and Agriculture Organization of the United Nation.
GADEB	General Authority for the Development of the Euphrates Basin
GAP	Guneydogu Anadolu Project , Southeast Anatolia Development Project(Turkish Water Management scheme on the Euphrates River)
GIS	Geographical Information System
GNP	Gross National Product
GRAND	Great Recycling and Northern Development (Canada)
HEPP	Hydroelectric Power Plant
HES	Hydroelectric Station
IBRD	International Bank of Reconstruction
ICWE	International Conference on Water and Enviroment (Dublin 1992)
ILA	International Law Association
ILC	International Law Commission
ILO	International Labour Organization
IMO	International Maritime Organization
INWC	Israeli National water Carrier
JNF	Jewish national Fund
NATO	North Atlantic Treaty Organization

NAWAPA	North-American Water and Power Alliance
OECD	Organization for Economic Cooperation and Development
OAU	Organization of African Unity
GCC	Gulf Co-operation Council
PE	Potential Evapotranspiration
PKK	Kurdistan Workers' Party
PNLM	Palestinian National Liberation Movement (Al-Fatah)
RF	Return Flow
RPU	Resource Planning Unit
SAR	Syrian Arab Republic
SIPRI	Stockholm International Peace Research Institute
TCSV	Turkiye Cevre Sorunlari Vakfi
TL	Turkish Lira
TNC	Trans-National Corporation
UAR	United Arab Republic
UNCED	United Nations Conference on Environment and Development
UNCLNUIW	United National Convention on the Law of the Non-navigational Uses of International Watercourses
UNCLOS	United Nations Convention on the Law of the Sea
UNDP	United Nations Development Programme
UNECE	United National Economic Commission for Europe
UNEP	United National Environment Programme
UNESCO	United National Education, scientific and Cultural Organization
UNGA	United National General Assembly
UNWC	United National Water Conference
USGS	United States Geologies Survey
USAID	United States Agency for International Development
WCED	World Commission on Environment and Development
WHO	World Health Organization
WWC	World Water Council

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TRANSBOUNDARY RIVERS AT-A-GLANCE

Jordan River Basin

Riparian States	Israel, Jordan, Syria, Lebanon and Palestine Tributaries
Tributaries	
Left bank	Basins River (Lebanon), Dan River (Mount Hermon)
Right bank	Hasbani River (Mount Hermon), lyon River (Lebanon)
Landmarks	Sea of Galilee, Dead Sea
Basin Area	11500 square kilometer
Mouth	Dead Sea
Length	320 km
Headwater	Lebanon, Syria, Israel and Jordan
Discharge	1.3 bcm/yrs.

Euphrates-Tigris Rivers Basin

Climates	Subtropical, hot and arid
Surface	35600 square kilometer
Rivers	Euphrates, Tigris, Greater Zab, Lesser Zab
Countries	Iraq/Iran
Basin area	343,317 square miles

Euphrates River

Riparian States	Iraq, Syria, Turkey
Basin area	Turkey, Syria, Iraq, Saudi Arabia
Discharge	818 cubic meters per second
Tributaries	
Left bank	Balikh, Khabur
Right bank	Sajur
Headwater	Turkey
Mouth	Shatt al-Arab
Length	2,289 kilometers
Discharge	At Hit
Average	356 cubic meters per second
Max	2514 cubic meter per second
Min	58 cubic meters per second
Basin area	765831 square kilometers

Tigris River

Riparian States	Turkey, Syria, Iraq
Discharge	818 cubic meters per second
Headwaters	Turkey
Tributaries	
Left bank	Batman, Khabur, Greater Zab, Lesser Zab, Adhaim, Diyala
Right bank	Wadi Tharthar
Headwater	Baghdad
Mouth	Shatt al-Arab
Length	1,862 kilometers
Basin	3, 75,000 square kilometers
Average	666 cubic meters per second
Max	1,825 cubic meters per second
Min	155 cubic meters per second

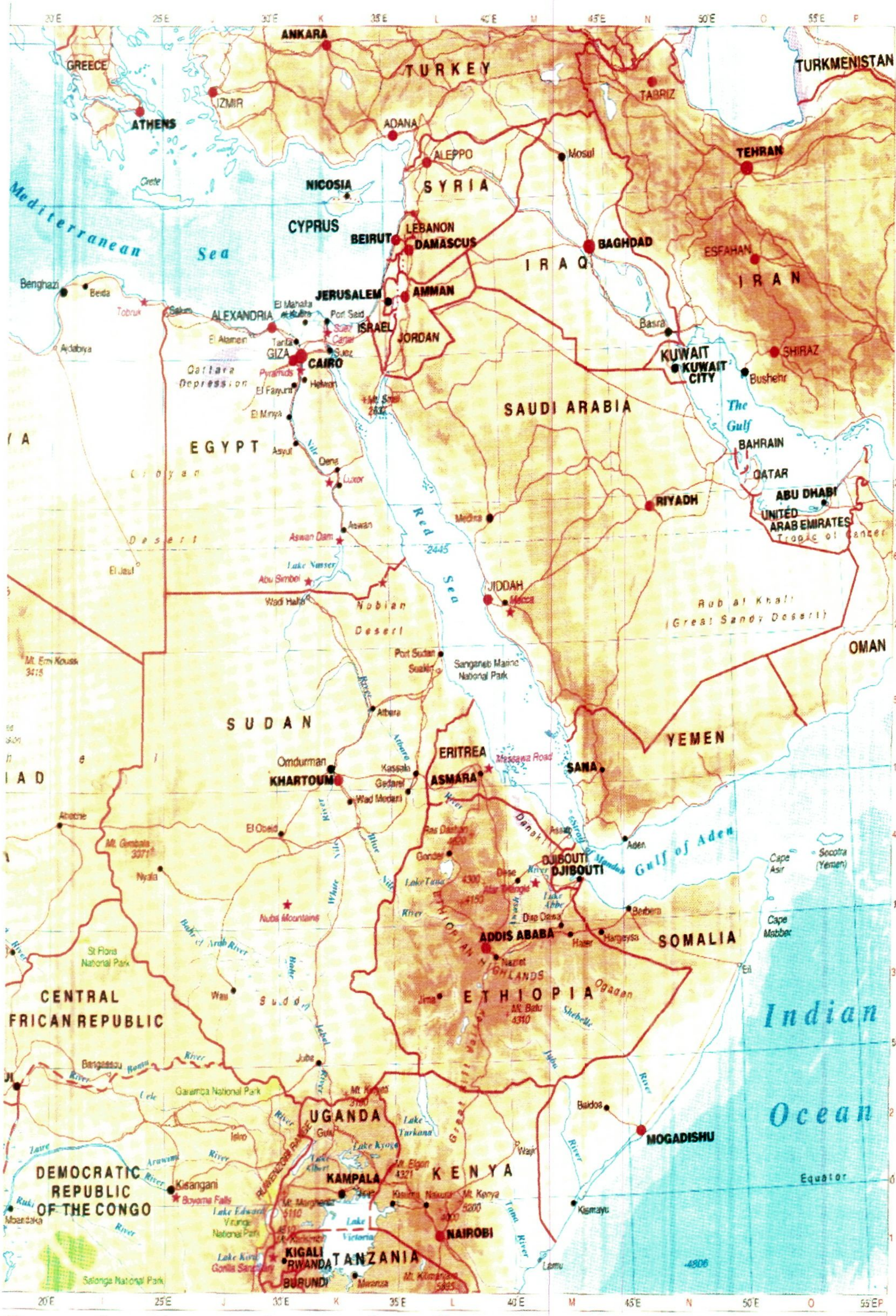
Nile River Basin

Riparian States	Burundi, the Democratic Rupublic of the Congo, Egypt, Ethiopia, Eritera Kenya, the Sudan, Rawanda, Tanzania and Uganda
Headwaters	Lake Victoria
Mouth	Mediterranean Sea
Tributaries	Blue Nile, Atbara and Sobat
Nile River Discharge	2830 cubic meter per second
Basin	3,400,000 square kilometers
Length	6,695 kilometers
Basin	3,400,000 square kilometers
Discharge	2,830 cubic meters per second

Chapter-I

Introduction

TRANSBORDER RIVERS OF WEST ASIA



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1.1: OVERVIEW

Water is the most precious life sustaining resource. The shortage of water imposes severe restraints on socio-economic development and consequently on political stability. At present about 40 percent of the world's population is facing serious water shortage. It is estimated that by the middle of 21st century nearly 68 percentage of the world population may suffer from water shortage.

The greater part of the West Asian territories fall in arid and semi-arid zones of the world which makes water a scarce, limited and exhaustible commodity. Almost all the states of West Asia are suffering from insufficient supply of fresh water which heightens the ambient tension among all the states of West Asia. Hence its control in the region is regarded as legitimate "hydraulic imperative". It is anticipated that scarcity and rapid diminution of fresh water in the region may prove to be catastrophic in future.

Many of the states in West Asia depend heavily on imported surface water, which comes through internationally shared river system. That in why the issue of water resources does undoubtedly play prominent role in the regional relations. In West Asia surface water is concentrated in three major rivers- the Jordan, the Euphrates-Tigris and the Nile River Basin (Map-1). These rivers basin, illustrate different aspects of the water crisis and have witnessed a high level of both conflict and cooperation. It is importance to note that one state in each river basin area has demonstrably identified itself as the key player Israel, Turkey, and Egypt in controlling over the water resources. They operate on the assumption that their water needs are more important and essential than their co-riparian.

The Jordan River basin has a long history of conflict between Israel and the Arabs. Competition for water has been strongest in the Jordan basin. It is generally believed that rumors of Jordanian and Syrian plans to divert the headwaters of the River Jordan were the principal cause of the 1967 Arab-Israeli war. Some have suggested that Israeli's systemic exploitation of the water resources of the occupied territories has been the main factor for its reluctance to consider a peace agreement based on the exchange of land for peace. Israeli occupation of the southern Lebanon is too considered as its intention to control the flow of Litani River. Many attempts to draw up a region-wide water management plan and a system of water allocation, which is acceptable to all parties, have failed.

The Nile is an important river system of West Asia as it plays a vital role in regional relations. The regional stability and economic survival of the riparian countries particularly Egypt, the Sudan and Ethiopia, are depend on the Nile waters. Egypt and Sudan are the two main largest consumers of the Nile's water. Egypt has only one major source of water supply the Nile to all the domestic, industrial and agricultural demands of its rapidly rising population. Egypt in 1991 was prepared to use force to protect the headwater of the Nile for reasons of national security. Obviously the warning was aimed at Ethiopia, which controls the 85 percent of the Niles higher flow, and the Sudan with which it has disputes over sharing of the Nile waters. Until 1920s Egypt was the only basin state who made use of water of the Nile. All the international and multilateral agreements had given priority to Egypt's hydraulic need as paramount. The Nile water Agreements of 1929 and 1959 between Egypt and the Sudan reflect the water sharing dispute between them. The Sudan share of the Nile increased from four percent in 1929 to twenty five percent in 1959.

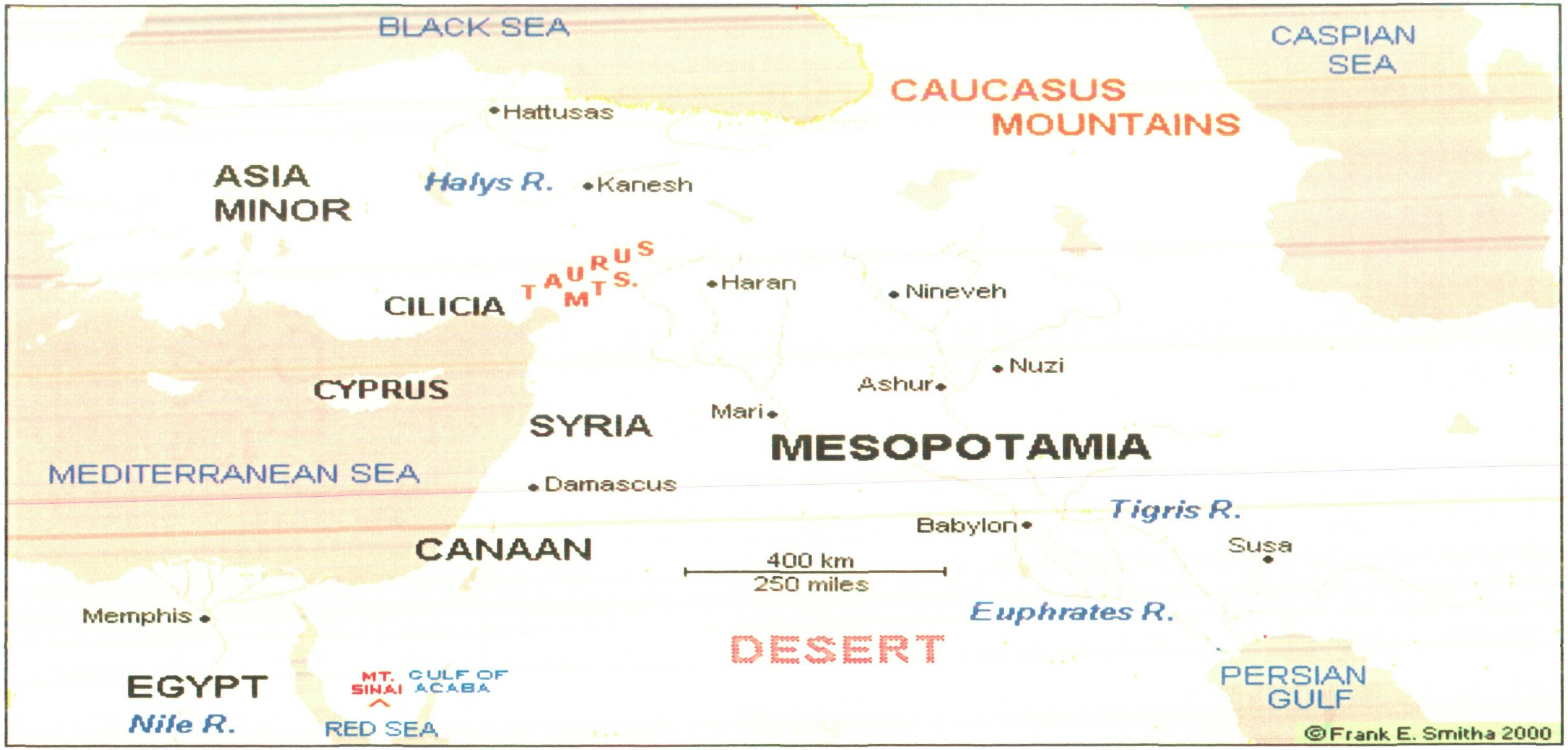
The draught in Ethiopia and the rising demand for water from its growing population, however, are changing the equation and forcing it to consider the sharing of the Nile water with Egypt and the Sudan. At present Ethiopia has launched various Agricultural development programmers with the purpose of achieving self-sufficiency in food production. It is moving gradually to implement the water projects on the headwaters of the Blue

Nile. These developments have threatened existing entente and also political stability.

The Euphrates-Tigris is imports are important international rivers which have tremendous regional importance. Control of these rivers has become increasingly contentious, as the demand for water increasing every year in this basin region. However, since the 1960s, with ambitious development plans in all the riparian states, the potential for conflict over the distribution of water has been growing. The three major riparian countries of the Euphrates-Tigris Basin-Turkey, Syria and Iraq-have rapidly growing population and are at same time pursuing development strategies that are heavily dependent on water resources. Therefore any disruption in water flow could constitute one of the strategically important security issues of these states.

The headwaters of the Euphrates-Tigris Rivers are in Turkey. Turkey, as the upstream state on the Tigris and Euphrates has sought to exploit water as its sovereign right in its territory, a right which its downstream neighbours strenuously dispute. The 1970s witnessed interstates tension between the riparian states of the Euphrates-Tigris basins due to their inability to reach formal agreement or working arrangements on allocations of water. In 1973 Turkey finished the building of the Keban Dam on the Euphrates which provoked Syrian anxiety and official protest. The construction of Tabqa Dam in 1973-74 by Syria and filling of the Lake Asad reservoir brought serious worries to Iraq about the reduction in the availability of water since it depends primarily on the Tigris system for the irrigation of its agricultural fields. Economic and political relations deteriorated and both Syria and Iraq came to the brink of war. However, mediation efforts of Saudi Arabia and the Soviet Union prevented the military confrontation between the two countries.

WEST ASIA



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Turkey's decision to develop South-eastern Anatolia created tension in the basin region. The scheme, known as GAP, consists of 13 main projects; seven on the Euphrates and six on the Tigris and 19 hydropower generating stations. The centre pieces of the project are the Ataturk Dam. Syria and Iraq protested vociferously and the former threatened to go to war. After negotiation a joint technical committee was formed. Since 1980 the committee has met many times but so far failed to reach any long-term Agreement. Thus GAP is a source of common concern for Syria and Iraq and to face the situation, they may forge an alliance against Turkey on the use of the Euphrates resources. However, amicable solution regarding the Tigris-Euphrates basin is not insight because of intransigence positions.

Water deficit is a function of supply and demand. In West Asia growing number of people and their increasing demand for food have added tremendous pressures on limited water resources. Consequently supply-demand disparities are growing in the region. However cooperation rather controls is needed to get the best use of scarce water supply.

1.2: SIGNIFICANCE OF THE STUDY

West Asia is one of the water poorest regions in the world. Water resources are limited in quantity and vulnerable in quality. Present uses are exceeding renewable supplies and the difference is being met by unsustainable practices. Costs of water delivery to different users are regularly increasing. Water resource management practices are neither financially sustainable nor environmentally sound. Water is a major issue in West Asia as it plays a prominent role in directing policies and defining strategies. The major driving force that will lead to transformation and reform of water policy and management in West Asia region is progressive socio-economic development. Fair allocation of limited water resources in the basin is a major issue. Water resources of West Asia consist primary of surface water and ground water. Surface water has throughout history has been a significant source of water in West Asia region outstripping the rainfed water in soil profiles. There is little or no naturally occurring soil water even in the winter when parts of the region do receive rainfall. By contrast in temperate zone crop production is almost totally based on soil water which occurs naturally. Soil water tends to be taken for granted in the economics located in the humid temperate zone. The huge volumes of water utilized by agriculture are not counted as part of the national water budget. Soil water is a free good. In the semi-arid and arid region like West Asia agricultural water is expensively obtained because of the costs of storage and distribution. Storage is needed to ensure timely availability and to reduce the loss of water for the economic activities of a political economy. Mobilizing such water can be politically stressful both nationally through environmental impacts, and internationally through riparian conflict.

The growth of population and their increasing demand for food have added tremendous pressure on water resources. Many West Asian countries motivated by fears of growing dependence on food imports are actively promoting a policy of food security and self-reliance as a national economic goal. However, food security is primarily a political and social policy objective which is pursued despite poor economic returns. Water used in the agricultural sector exceeds by ten times the water used by the industrial and municipal sector combined. In West Asia the dominance of the agricultural water demand is posing challenge to national water budget. At the national level over 80 percent of all national water budgets are devoted to the agricultural sector. As a result all economies in West Asia are coping with serious water deficits. The major indicator of the scale of the water deficit of an economy is the level of its food imports. Water is required to raise food to insure subsistence. The raising of food is integral to society. Almost all the states of West Asia are critically dependent on food imports to meet the increasing demand for food as population in all states of the region are expanding rapidly at an average annual rate of 2.2 to 3.7 percent.

Consequently, the limited water resources of the region can not keep pace with demand.

The lack of adequate rainfall restricts the plenty of fresh water supply. Throughout most of the West Asia, rainfall varies between 250 mm to 400 mm per annum with 50 mm in extensive desert plains. The exceptions are the higher mountains of Lebanon, certain parts of Turkey and Iran. This variation in annual amount of rainfall has imposed limitation on the level and type of socio-economic and political development throughout the region. In such circumstances water control becomes socio-political imperative and disputes over shared water resources inevitable. The principal river basin areas of West Asia - the Jordan, the Euphrates-Tigris and the Nile- illustrate different facets of the water crisis. Tension is inevitable if upstream on international rivers embark on projects which reduce the flow of water downstream. Turkish relations with Iraq and Syria are strained over Turkey's southeast Anatolia Project. Egypt is concerned about the water developmental activities of the upstream users of the Nile. At present, Israel has control over the major part of the Jordan Basin water, giving it precedence over Arab states. Hence this study tackles the issue of water sharing and problem of water management and conservation. In addition, the study touches the growing supply-demand disparities and introduction of more efficient water delivery systems that can make extraordinary impact on national water budgets of riparian states.

1.3: STATEMENT OF THE PROBLEM

Since antiquity water in West Asia has been a dominant concern for the growth of economic activity and human settlement. Being the water deficit region of the world, socio-economic value of water has always been appreciated by the people of West Asia. It has been considered as a valuable finite resource for survival and well-being in the region. Consequently perennial water sources have played crucial role in shaping social, cultural, economic and political structure of the region. The rate of water consumption in West Asia has surged many folds with the increase of population, rapid growth of urbanization and socio-economic development. Moreover, agro-industrial expansion and aspiration for greater economic development has further increased the pressure on limited fresh water supplies, bringing the region at the edge of water crisis.

The present and expanding water uses in West Asia have increased transnational dependencies on shared water resources. The management and development of these shared water resources pose special challenges which sometimes turn into explosive political issue. Geopolitically, the entire major water resources of West Asia-both rivers and aquifers-are shared by several countries and are classified as international water resources. These transborder water resources particularly rivers have been the source of mistrust and conflict between the riparian states.

There are very few international agreements over water sharing in the region. This has deeply influenced the course of social, economic and political development in many countries of the region. As a result the need for safe water becomes a dominant concern. The problem becomes more complicated when water management and sharing of surface and ground water resources are over shadowed by political issues. The absence of multilateral or comprehensive bilateral agreements on water allocation in West Asia illustrates the political mistrust in a wider sense and relative lack of economic cooperation in the region. Moreover, most of the states have linked the water sharing issue with the national security and also its control as an effective bargaining tool in the political process.

The major river basins of West Asia-the Jordan, the Euphrates-Tigris and the Nile-exhibit the different types of the water sharing problem. These river basins have diverse hydrological endowments and very diverse pattern of individual national demography, resource utilization and economic performance. The profiles of riparian rhetoric of water right assertion, recognition and attainment have also evolved in very different ways. The hydropolitical dynamics of these three basins explain the degree of mistrust and lack of mutual cooperation and understanding between riparian states. It may be assumed that when water resource management is handled properly it can provide the basis for economic growth, improvements in living standards and socio-political stability. The experience of the past, however, shows that these benefits are undermined by poor management of water resources. The present study focuses on the water sharing problems and issues of the transborder river basin.

1.4: RATIONALE AND HYPOTHESES

Water is a strategic resource vital for human well-being, for economic development and for state security. In West Asia, fresh water supply is relatively fixed and limited. Consequently, most of the countries of West Asia are experiencing conditions of water stress and water scarcity. Moreover, uneven precipitation, recurrent severe floods and droughts, and the extreme fluctuations of the rivers and water tables have made annual water supply in the region erratic and precarious. Thus, its control is considered paramount for the economic and political survival of the state and people. What makes the crisis even more complicated is the fact that water is not just a scarce resource but a shared one as well. Lack of basic agreement on an equitable distribution of water resources has led to political mistrust and mutual suspicion between states of West Asia. A number of recent studies suggest that water shortage in West Asia will intensify and aggravate competition between states and will lead to the unprecedented upheavals. In fact, the water crisis relates fundamentally to the nature of water allocation and use within states rather than to water allocation between states. It may be asserted that efficient water resource management on national and international level and proper use of water in various sectors of economy can inevitably provide certain level of water security. Disputes over shared water resources, which attract attention and present a sensational image of instability, is widely tipped as the next cause of conflict in the region. However, the historical evidence suggests that the indigenous inhabitants of the region deliberately set out to cooperate and coordinate their collective efforts in a systematic way to control the hydrological chaos of the region for the sake of all riparian parties. Cisterns in the Jordan Basin, Qanat systems in the Arabian Peninsula and hydraulic projects in Mesopotamia are symbols of these cooperative efforts. A reasonable assertion seems to be that water scarcity in the region has invariable been a platform for cooperation, through which all riparian states have achieve greater gains. However, the study of water sharing as a factor for cooperation and co-existence has not been under taken to a great extent. Hence we asked the following questions for this research.

1. The political stability in the region depends to a greater extent, on the socio-economic development. Water is a crucial element in this equation.

2. Uncertainties regarding population growth, agricultural needs, industrial requirements, and possible global warming have made long-term assessments of water resources difficult.

3. In a river flow shared by several countries unchecked upstream developments could prove a matter of serious concern to down stream users. This is why water security is one of the most crucial elements in the national security considerations of many countries.

4. The management and development of shared water resources pose challenges, which sometimes turn into explosive political issue.

5. Water resources management can provide the basis for economic growth, improvement in living standards and socio-political stability. Poor management of water resources can undermine these benefits.

6. The main hypothesis is that contrary to most frequently mentioned scenario in the literature which suggests that disputes over water supplies will lead interstate war. It is unlikely that the quest for more water will cause a new war in the region.

7. Water shortage should be seen as a platform for regional cooperation that promises development and exploitation of the regions water supplies in ways that all riparian nations can achieve optimal solutions. However joint cooperative development of common water resources will actually reinforce peace.

1.5: OBJECTIVES OF THE STUDY

This study seeks to achieve the following objectives:

1. Inquiry into the conduct of riparian states transnational river basins of West Asia.
2. Analysis of the actual needs of the countries bordering these basins and the political implications of the unevenly distributed regions water resources.
3. Find out the obstacles which have prevented the countries of the region reaching a cooperative basin-wide arrangement, which is the optimal method for development and exploitation of their common water resources.
4. Define the limitations and opportunities for the achievement of cooperative solutions to the problem of managing a common property resource and to avoid both the tragedy of the commons and regional violence.
5. Put forward an interpretation of water politics in which water is seen as a critical factor in moving countries towards cooperation rather than military conflict with their co-riparian neighbours.

6. Review the hydrology of the principal transborder river basins of West Asia, and investigate the strategic dimensions of water problems and their implications for the future.
7. Present water resources management practices and provide an overview and recommendations on surface water management practices.
8. Provide recommendations for future studies or appropriate actions.
9. The objectives of the study are to find the dynamic properties of the water issue and to understand the mechanisms and feedbacks in the system. Further, it is also important to be able to set the problems with water supply in the context of the whole geo-political situation in the Trans National River system of crucial importance is to understand the system of water usage, decision mechanisms and actions of different population groups. The utilimate expected out come would be to find a stable, fair and equal supply of water, which would be sustainable in a long term perspective.

1.6: METHODOLOGY

The methodology of the proposed research work is a descriptive analysis with a combination of empirical data. The emphasis of the study is on dispute over water sharing of Trans border Rivers and its role in the regional relations. The data and other materials obtained would be thoroughly checked and cross-checked to eliminate discrepancies wherever existed before embarking on building up the thesis. With regard to adopting analytical approach, simple mathematical techniques are to be relied upon. The entire research work has to be seen under a theoretical background. Computer will be used to analyze the data and materials. Maximum effort will be made to complete the necessary data and its interpretation through whatever means available such as archival research, case studies of international experiences of similar projects, and the use of internet for research, communication, and transfer of knowledge. Being an exploratory study all possible means will be tapped to draw relevant information.

A general model of decision making involves an analytical effort aimed at identifying and understanding problems, the design and representation of alternative solutions, the evaluation of these and the choice of one of them as the most desirable. This methodology consists of three separate but interrelated phases: intelligence, policy, and choice. The goal of the intelligence phase is to identify and understand the situation addressed. It involves the identification and elucidation of the current problem situation, identification of constraints the formulation of goal and the development of some guidelines on which the proposed policy is to be based upon. The second step is the generation of alternative solutions to the problems identified with the situation being addressed. The choice phase of the methodology involves the evaluation of possible scenarios or alternative policies.

1.7: LITERATURE REVIEW

The water crisis facing different parts of the globe, embraces both developed and developing countries. These facts suggest that the growing problems in the water domain need to be better understood if they are to be solved. The literature on this issue reflects a realization of this need. The UN has long been stimulating research into the water crisis, and according to *Falkenmark's* assessment (1990: 188), 20 UN bodies are now involved with water issues. In addition, many academic institutions, centers, corporations, consulting firms, foundations, national and international agencies, non-governmental organizations (NGOs) non-profit and private organizations have also recently become interested in hydro politics and water-related issues. As a result, there are scores of published studies, as well as a burgeoning literature on water issues available on the internet.

A view of world politics suggests a positive relationship between resource scarcity and conflict. Applying this analysis to fresh water resources, (Falkenmark & Widstrand, 1992: 4) argue that 'access to water has generated political and military conflicts throughout world history'. Military analysts such as (Thompson, 1978: 62-71) claim that 'fresh water is similar in many respects to other of the world's scarce resources' and since 'fresh water is becoming increasingly scarce'. It is thus becoming 'increasingly a source for future conflict'.

Falkenmark sees the fresh water issue as a present and future focus of international disputes and as a factor in conflict formation. She argues that frustrations over scarcity of water and over dependence for water upon upstream countries may develop into disputes. 'Water can be a strong contributing factor to armed conflict', she believes 'even if this is not often recognized (1986a: 109). From a similar perspective, (Gleick, 1993a: 79) argues that, as the twenty first century approaches, water and water-supply systems are increasingly likely to be objectives of military action, instruments of war, and a salient element of interstate politics. Emphasising the role of resource security as a crucial factor which affects both national and international security, *Gleick* asserts that' the focus of security analysts must now be when and where resource-related conflicts are most likely to arise, not whether environmental concerns can contribute to instability and conflict' (Gleick, 1993a: 82-4).

Water scarcity is a very critical issue that affects the national security and survival of each society. To substantiate this argument, it has frequently been claimed that water disputes were the principal cause, or at least one of the main causes, of the 1967 Arab-Israeli War. A systematic examination of the 1967 War however, reveals that the water issue was only a contributory factor in that conflict, not a causal determinant of it. Moreover these writers typically overlook the fact that many countries in which water is the most critical resource constraint, quite often cooperate actively in increasing their shared water resources. Egypt and Sudan have long cooperated on the Nile River, based on the Aswan Dam and Lake Nasser, and on the *Jonglei Canal Project.* Their agreement not only governs the sharing of the Nile's waters, but also contains an instrument for settling controversies by negotiation (Howell & Allan, 1994). Mauritania and Senegal have cooperated for nearly a quarter of a century in building dams and managing the Senegal River through.

Fore case-studies by *Cano (1986), Chomchai (1986), LeMarquand (1986) and Mehta (1986)* demonstrate that established agreements on transboundary water resources in Third World countries exhibit a general spirit of non-confrontational approaches to water issues and a willingness to accommodate variations within a carefully designed system of rules and regulations. In fact, there is even a history of tactical cooperation over water, albeit limited in scope, between antagonistic neighbours such as India and Pakistan (Alam 1998; Mehta 1986; Kirmani 1990, Biswas 1992), Iraq and Syria Israel and Jordan have demonstrated confrontational approaches to water issues.

All water-resources disputes lead to violent conflict; indeed most lead to discussions, negotiations, mediations, and non-violent resolutions. Moreover, given the general atmosphere of tension in the West Asia, it is remarkable that so little open conflict over water has erupted in this volatile region. Paradoxically, complexities and tensions raised by hydrological problems have often tended to compel cooperation where other non-water antagonisms have degenerated into warfare (Naff & Matson, 1984: 4). Therefore, it can be argued that there is no iron law determining that water scarcity per se must inevitably lead to destruction, competition, or violent conflict. This argument has been briefly advanced by *Joseph Dellapennna, Arun Elhance & Daniel Deudney.* For instance, (Dellapenna, 1995: 89) argues that the very importance of water makes co-operation over water more likely than conflict'. He maintains that 'as in ancient times, the shared need for optimum management of this scarce resource can become a source of regional unity rather than regional discord'. Similarly (Deudney, 1991: 26) contest the idea of 'water war arguing that, it seems less likely that conflicts over water will lead to interstate war than that the development of jointly owned water resources will reinforce peace.

Falkenmark argues that since many river systems and large aquifers are shared by several countries, this geographical fact 'adds to the risk of international disputes or even confrontations, especially in view of sharply divergent interests in the shared resources of the upstream and down stream countries' (Falkenmark, 1990: 177). Accordingly, the highest levels of frustration that will arise from increasing water scarcities can be expected to develop in countries where populations are increasing dramatically and where most of the water sources are transnational (Falkenmark, 1986a: 109; Gleick, 1993c: 108-10).

1.8: LIMITATION OF THE STUDY

As the water issue has become a high security priority, compared with other issues in West Asia, so water-related data have become politically sensitive. Most of the data related to water resource management and allocation are after inadequate or unreliable or both. Several factors account for the general paucity of statistical information. Water is not like other commodities in that because it flows both on the surface and underground hence it is difficult to own. Secondly water rights are difficult to arrange precisely because water ownership is not easy to vest, and usually impossible to operationalise. Moreover information on basic feature of hydrology viz. diversion, depletion, control of water resources percapita consumption, water discharge and rate of evaporation are hard or tough to measure precisely. It is, therefore, recognized that data limitations preclude the evaluation of a more comprehensive study of the water right and water management.

1.9: IMFORMATION SOURCES

The main sources of information for the study are:

1. Data and statistics issued by governmental and non-governmental institutions.
2. Studies, resources and reports issued by specialized institution.
3. UN publication
4. Information available on the interne

The study also will be benefited from research and reports on transborder river waters dispute conducted by local and foreign institutions particularly the UN.

The geographical approach of study is field oriented. But the extent and dimension of the proposed work is so vast and related to several countries, field-oriented study is not possible due to many retarding and compelling factors. Hence the study is primarily based on secondary data.

1.10: WATER: A GLOBAL PROBLEM

Water is a global problem. Many countries in the world at present are facing shortage of fresh water supply. It has always been the principal challenge for humanity from the early days of civilization. Today, several of the major issues confronting humanity are still related to water: including pollution, desertification, water logging of agricultural lands, flooding and water scarcity related problems (World Bank, 1995: 5). Expanding water usage in various sectors of economy has increased transnational dependencies at a global level. The competing and inflicting demands for good water are a universal problem rather than an issue confined to arid and semi arid regions as North Africa and the West Asia (Postel, 1992: 20-22).

The rapid rise of population, agricultural needs, industrial requirements, and possible global warming have made long-term assessments of water resources difficult. However, we can be sure that water use will continue to increase, water pollution will continue to put pressure on usable water supplies, and water will continue to be the principal resource problem of the world (Folkenmark, 1990: 189).

While there is no substitute for the supply of water, unlike most resource the world's total water consumption has quadrupled during the last fifty years (Clarke, 1991: 66). In 1940 total water use was about 1000 cubic kilometer per year. By 1960, it had doubled and by 1990 it had doubled again. This rate of increased water consumption is not expected to decline, yet today's global per capita water availability is predicate d to fall by one third over the next generation (World Bank, 1995: 5). It is important to note, however, that water resource management is not just the domain of engineers, it presents a multitude of complex challenges derived from the interaction between human behaviour and the water cycle (Falkenmark, 1990: 190).

Indeed, many studies, reports, and assessment suggest that a loaming world wide water crisis is on the horizon. These studies indicate that present and expanding water uses will increase transnational dependencies on shared water resources in different parts of the world. Infect the extent of water interdependency in already very extensive. Over 240 river basins are shared between two or more states (Blake et. al., 1995: XIV), comprising about 50 percent of the land and more than 40 percent of the world's population (Vlachos el.al., 1986: 1-2). It is estimated that nearly 50 countries on four continents have more than 75 percent of their total land in such basins; more than 250 basins are multinational, including 57 in Africa and about 50 in Europe. Out of the world's 214 shared rivers 148 flow through two countries, 31 through three countries and the rest shared by four more countries (Butter, 1995: 34).

The management and development of these shared water resources pose special challenges, which sometimes turn into explosive political issues. As the demand for water increase, and as exclusively indigenous sources of water are fully developed, the only other sources are likely to be international. But, in the absence of explicit regulations, international sources often breed tension. For example, in river flow shared by several countries, unchecked up-stream developments could prove a matter of serious concern to downstream users (UNWC, 1977).

In West Asia water resources are declining, while representing 5 percent of the total world population, West Asia countries only 0.9 percent of global water resources. The number of water-scarce countries in West Asia has rise from three in 1955 to eleven by 1990. Another seven are anticipated to give the list by 2025. In addition to its scarcity, much of West Asia water stems from there major water ways: the Nile, the Jordan and the Euphrates-Tigris River Basins (Mostafa, 1999: 23-18).

Chapter-II

Significance & Demand of Water

(A). THE BASIC IMPORTANCE OF WATER

Water is the most abundant chemical substance on the earth's crust, covering more than half of the five kilometers deep outer shell of the earth. Water and air are vital to the existence of both man and life itself. Water and watery solutions play an important role in the physical biological and geological processes, which take place on the earth. Population centers have evolved on the shores of water bodies, creating economic development along sea-shores and in major river valleys such as the Jordan, the Euphrates-Tigris and the Nile, (Gustafsson, 1985: 130).

The problem of water scarcity is a growing worldwide phenomenon. Net renewable water resources per capita have declined dramatically over a single generation and in little more than thirty years from now would reach dangerously low levels. By the year 2025 the average net water resources in the West Asia are expected to be less than 700 cubic meters per person per year, half of what they are today. The sharp growth in global population and development has badly depleted and polluted the world's water sources. This situation is already keenly felt in India, China and Mexico, and even in the United States there is a problem of deteriorating water quality (Gleick, 2001: 45).

More and more dilemma arises between water use for industry and agriculture and use for domestic household purposes. Of the 5.5 billion people in the world today, 3.5 billion are forced to live with less than 50 liters of water per person per day, one-seventh the quantity used by the average American. Agriculture uses 73 percent of the world's fresh water and the world needs more agriculture because of increasing food needs. Water consumption in several countries already exceeds renewable supply; others are at or close to the limits. In many poor countries, famine is prevented only by grains and cereals taken from global grain stocks. Lately, however, these stocks have dropped sharply. In 1987 they were sufficient for 101 days but by 1989 stocks had dropped to only 54 days (Gleick, 2001: 65).

Furthermore, experience showed available water resources drop to between 1,000 and 2,000 cubic meters per capita per year, large investments are generally required to meet ongoing water demand. However, when resources fall below 1,000 cubic meters per capita per year, difficult socio-economic adjustments are then required to cope with such scarcity (Bouwer, 2002: 2).

Water conflict exists in many places around the globe, such as between India and Bangladesh, Israel and its neighbours, Egypt and Ethiopia, Turkey and Syria, Turkey and Iraq. At the same time the distribution of water sources is highly uneven. Many countries with small populations possess large amount of water whereas many populous countries face acute shortages. Yet there is a limit to man's ability to bring water from one place to another by building dams, tunnels and hydroelectric projects without causing irreversible ecological damage and in circumstances where such damage is probable, the financial assistance usually available from organizations such as the World Bank and International Monetary Fund will likely be denied. Additionally, the worldwide tendency to utilize fresh river water just before it reaches the sea has proved disastrous because a river's most biologically productive part is the brackish zone where fresh and salt water meets (Shiklomanov, 1990: 34).

The global shift from raifed to irrigated agriculture has increased the salinity of the earth in many areas and evaporation of fresh water has left chemical pesticides and fertilizers in the ground. In addition, experience has shown that attempts to dam flood waters have prevented the normal drainage of destructive salts out of the soil to the sea, thereby rendering the soil unusable. Furthermore, there is a proven link between deforestation and a reduction in the amount of rainfall. In Western Africa, deforestation has already contributed to shorter rainy seasons. In Florida, the reduction of vegetation has led to a 10 percent drop in rainfall over the past 30 years.

Once exposed, land reflects more sunlight, producing atmospheric processes that reduce rainfall by drawing dry air into a given area (Allan, 1996a: 82).

A prevailing scientific consensus agreed upon at the United Nations Water Conference in 1977 placed the world's total volume of fresh water at less than one thirteenth of all the water on the globe with the water moving in streams each year estimated at 40 to 47 trillion cubic meters. Altogether, at any one time, about 22 percent of the fresh water is in the soil and in the ground water storage and flows, 0.35 percent in the lakes and wetlands, 0.04 percent in the atmosphere, less than 0.001 percent in the streams and about 77 percent in snow and ice. There is some doubt about how much of the ground water is within economic pumping depth: perhaps only one-third at the most (Shiklomanov, 1990: 34-35). It is also relevant to note the very unequal per capita distribution of the available water resources in the world. Relative per capita water availability has been classified into seven categories (Table no-2.1).

Table No-2.1

Relative water availability (cubic meter per year capita)

Extremely low	**below 1,000**
Very low	1,000 to 2,000
Low	2,100 to 5,000
Medium	5,100 to 10,000
Above Medium	10,000 to 20,000
High	20,000 to 50,000
Very High	Over 50,000

Sources: Shiklomanov, 1990:40

Individual users depend on the availability of a relatively small volume of one cubic meter per year as a minimum supply of potable water and an additional volume of safe water which increases with economic and social development and advancing technology. In modern society, water is used in all sector of economy such as, agriculture, industrial transportation, recreation, domestic human consumption, general sanitation etc. In 1940 the world's average percapita water use, including water diverted for irrigation was below 400 cubic meters a year reflecting the increased use of water in all sectors especially in agriculture (Clarke, 1991: 32).

Irrigation is, by far, the biggest and most rapidly expanding user of water since plants use large quantities of water during their growth. Under dry conditions, it takes about 1000 cubic meters of water to produce one tonne of plant growth. Where rainfall alone is insufficient to meet plant needs, irrigation is required and the volume of water needed rises dramatically. The amount of water used for irrigation has increased ten times this century and elaborate plans are still being made to extend irrigation to more and more areas (Clarke, 1991: 27).

Why does water cause so much conflict? Generally, because it is essential to life "There is virtually no human artifact or commodity that is produced in the absence of water. Agriculture is impossible without it and so are most manufacturing processes". But specifically, because water flows:

"Their unregulated flows are likely to be erratic and in an arid country, the consequences for any user unable to capture water the moment it is needed are likely to be dire (Maas & Anderson, 1978: 2). In West Asia, water exhibits all of these elements of conflict.

As a contemporary issue of security and International Relations, water displays certain distinguishing characteristics:

- Water as an issue is pervasive, highly complex, and utterly vital.
- Because of its complexity, water is fragmented as a strategic and foreign affairs issue, tending to be dealt with piecemeal, problem by problem, rather than comprehensively, both domestically and internationally.

- Water is always a terrain security issue, especially when scarce, since all concerned parties feel compelled to control the ground on or under which water flows.
- The relationship between water dependency and security is perceived as vital and often absolute. Water issues are seen as zero-sum, especially where two or more mutually antagonistic actors compete for the same water source.
- As a zero-sum security issue, water carries a constant potential for conflict.
- International Law as a means of settling and regulating fresh water issues remains rudimentary and relatively ineffectual without prior treaty arrangements in place.
- Water is a highly symbolic, contagious, aggregated, intense, salient, complicated zero-sum power and prestige-packed crisis issue; it is highly prone to conflict and extremely difficult to resolve (Frey & Naff, 1985: 77, Naff & Matson, 1984: 8).

(B). WATER IN WEST ASIA: AN OVERVIEW

Water is the most precious and limited natural resource in West Asia. West Asia is a developing region and water scarcity is not a new phenomenon in the region (Murakabmi, 1995: 1). It is one of the most important basic resources of our world. It is a life sustaining resource and without it no living thing, plant or animal, can exist. It is required in abundance not only to quench our thirst and meet our domestic needs but to maintain the socio-economic development (Lepawsky, 1963: 533). While demand for water is rapidly increasing in West Asia; the supply of fresh water is finite. As a result, the situation is getting worse and the shortage of water is approaching at crisis levels. The major rivers of the region are: the Jordan, the Euphrates-Tigris the Shatt al-Arab, and the Nile (Murakabmi, 1995: 1).

West Asia is generally known as a water deficit region in the world. The attendant problem to water scarcity is particularly acute in the West Asia, as the region has one of the fastest growing populations (Lowi, 1995: 124-126). Water may be more important than other politics, where as proven oil reserves in the area are estimated to last at least 100 years, water supplies are already insufficient throughout the region, and competition for it is inevitably going to increase in the years ahead. In addition, there are number of rivers in this region that traverse international boundaries established during the twentieth century, and that have become a focus of interstate tension (Lowi, 1995: 124).

While the Geography prescribes the unitary development of the river basin, the contingent ties of history may prevent the process. Furthermore, the concern to maximize individual benefits provides powerful incentives to exploit resources unilaterally. States are constrained in their behaviour by structural factors as well (Lowi, 1993: 1).

The most regions of the world hydrograph are largely controlled by rainfall, with landforms and geological structure as subsidiary factors. As the result of a generally deficient rainfall, however, the West Asia shows to an unusual degree of the influence of topography and structure in the development of its river systems (Fisher, 1971: 32).

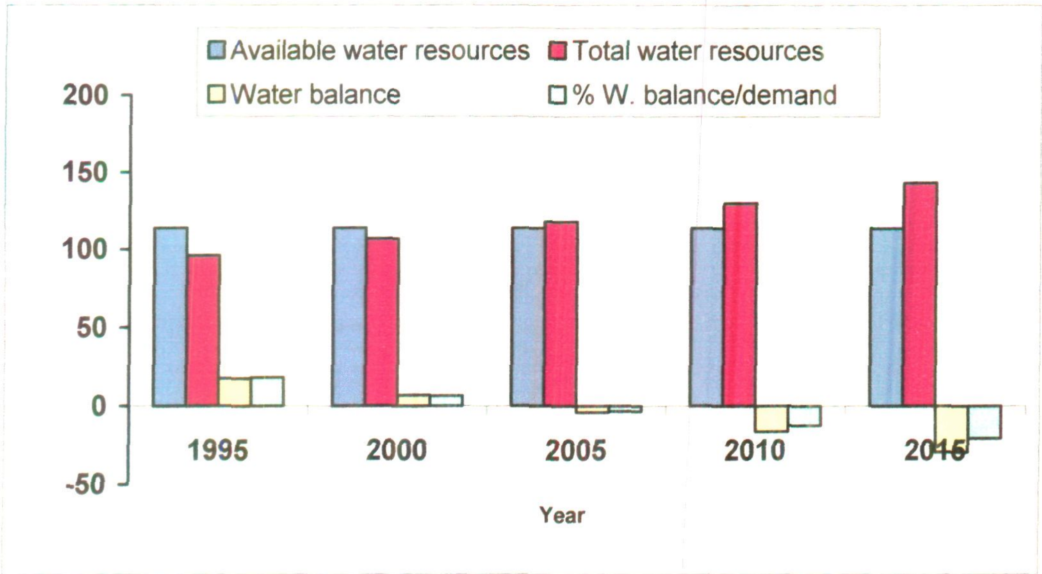
Table No- 2.2
Water Balance in West Asia

West Asia region	1995	2000	2005	2010	2015
Available water resources	113.76	113.76	113.76	113.76	113.76
Total water resources	96.07	106.78	117.87	130.03	143.20
Water balance	17.69	6.98	-4.11	-16.27	-29.44
% W. balance/demand	18.40	6.50	-3.50	-12.50	-20.55

Volume in multiples of a thousand million cubic meters

Source: GEO-2000

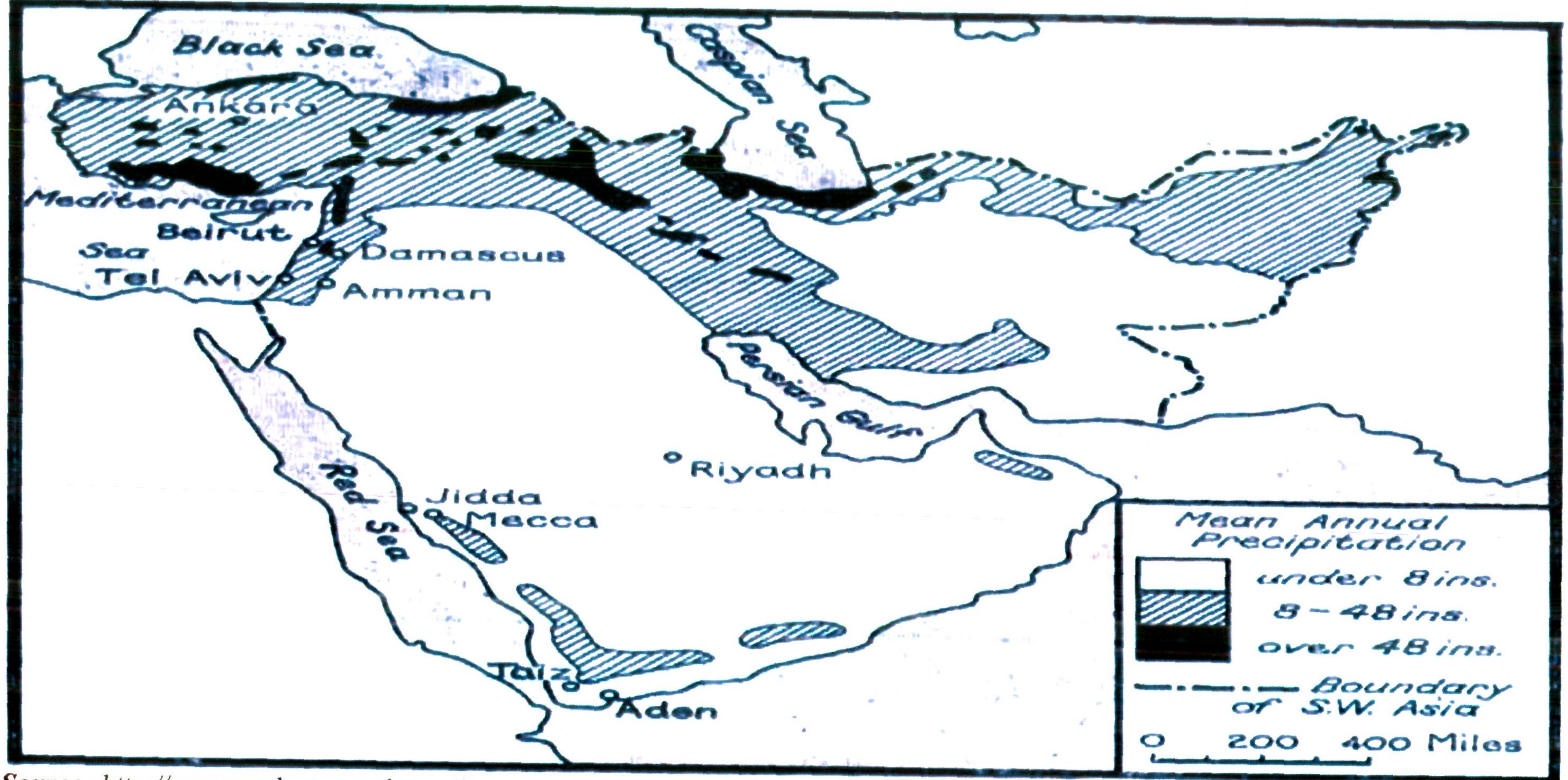
Graph-2.1 : West Asia Region



West Asia is large and diverse region of the world. Water balance of West Asia is very delicate and shows the descending of the resource (Table No-2.2). A topographical condition of West Asia is complex and difficult to describe in a simple way. For convenience the region may be divided into two separate units. The northern mountain zone overlying the states of Turkey, northern Iraq, Syria and Iran, which consists of Lofty Mountain ranges. The Southern zone consists of plains and dissected plateau (Beaumont, 1976: 17). A characteristic feature of the region is that plateaus are situated in between most of the mountains. It is almost everywhere 500 meters in height. The Anatolia plateau stands between the two major mountain belts (Pontus and Taurus). The Pontus Mountains lie in the north along Black sea with the highest peak, Kalar Dagi, 3870 meters above sea level. The Taurus range is a great formidable mountain chain. The highest peak is Mor Dagi, 3147 meters located in the eastern Taurus (Stephen, 1970: 19; Fisher, 1971: 344). The Pontus and Taurus ranges consolidate near Mount Ararat (5,165 meter) in a complex massif. From here eastwards mountain chains enter into Iran and once more divide into two distinct mountain belts. The Northern belt known as Elburz Mountain goes along the southern share of the Caspian Sea. Mount Damauand (5,610 meter) is the highest peak of the Elburz mountain range. The southern belt overlooking the Euphrates-Tigris low land and the Gulf enters Iran from Mount Ararat. The southern ranges are known as Zagros Mountains which attain maximum height of 4,548 meter in Zard kuh. A very complex pattern of mountain ranges, reaching only 2,500 meters in altitude, usually named as eastern Iranian highlands, are located in eastern Iran on the borders of Afghanistan, surrounded by these highlands in the central Plateau of Iran. The plateaus have an important place in the physical features of the region. The central plateau of Iran is occupied by a series of closed basin with no outward drainage of any sort. Plains also play a significant role in the physical features of the region. This is almost every where above 500 meter in height and is subdivided into two major basins, Dasht-e-Kavir in the north and Dash-e-Lut in the south (Beaumont, 1985: 34)

In the southern region at the southeastern corner of the Arabian Peninsula highest land is found. Highlands also are located along the whole of the Western part of Arabia, with a general level of the land declining to the north and east. The upland areas exist along the western cost in the Levant region. South of these uplands Mount Hermon attains the height of 3000 meter. A broad low land valley, know as the Beqaa, drained by the Litany River in the south and the Orontes in the north, between the Lebanon Mountains and Anti-Lebanon mountains. Further south exists the north-south fault zone of the Dead Sea lowlands. The fault zone has dissected the upland belt its form a trough like region descending to 390 meter below Sea-level. The valley of the River Jordan is the main zone with a high degree of intensive agriculture. The Jordan River draws its headwaters from streams rising in Lebanon, Syria, Jordan and the occupied territory. The largest low land belt extends from northern Iraq to the west of the Indian Ocean in Oman, Iraq is a country largely dominated by two of the world's greatest rivers the Euphrates-Tigris both of which rise in eastern Turkey. To the west and south of this river-Valley, the desert plateau rises gradually to merge

CLIMATE OF WEST ASIA



Source : http://www.probertencyclopaedia.com/photolib.maps/index.html with that of Syria, Jordan and Saudi Arabia. Both the rivers merge to form a single stream, the Shatt al-Arab at Qurna, 185 kilometer from the Sea (Held, 1989: 207-223).

The Gulf lowlands lie in the south eastern part of the Arabian Peninsula. Still further east the land rises steeply to or belt of uplands called as Gebel al Akhdar (Green Mountain). The western shore of the Gulf expands into an extensive plain. This zone is well known for its arid and barren land and the largest sand sea of the world, the Rub 'Al Khali, is located in Central Arabia can be described as a plateau tilted down to the east. The whole of plateau in corrugated with deep Wadis caused by the erosive process of rivers. Many of these Wadis are still entered with layers of clay deposits left behind by this fluvial action in the past. The largest sound-filled dry Wadi is that of Hadhra Mount in Yemen. Wadi Sirhan in the Nafud region in Saudi Arabia is another example. There are no perennial rivers in the Arabian Peninsula. Egypt part of the southern region has the Red Sea Hills on the eastern coast while the Nile delta forms the major lowland. On both the sides of the Nile River lie the vast deserts, with Oases in artesian depressions here and there, where water is near to the surface (Held, 1989: 31-45).

The climatic condition of West Asia varies as the region is large extends over many latitudes, and exhibits great physical diversity. In most of the West Asian states climate is harsh and arid with scanty rainfall and very high potential of evaporation except in the coastal and mountainous regions. Cyclones come from the west, cross over the Mediterranean Sea and enter West Asia. Some areas of the region which are nearer the Mediterranean Sea experience a special type of climate called the Mediterranean climate. The winter is mild, summers are warm and there rainfall is during the winter season (Beaumont, 1976: 55-60). Through-out the region there is a shortage of water. Only in parts of north-eastern Turkey and north-western Iran there is surplus water supply. Smaller areas of surplus water supply occur along the highland regions of Turkey, the higher parts of the Elburz Mountain in Iran, along the Coastal Strip of Syria and the Lebanon and the Black Sea coast of Turkey. Water surplus areas permit river system to exist in the region. They are also responsible for replenishing the ground water resources (Fisher, 1981: 35-45).

The surplus water of northern region is transported through very great distances into areas experiencing water scarcity by river systems and ground water reservoirs. For example, the Euphrates-Tigris Rivers transport the surplus water to the intensively arid regions of southern Iraq (Fisher, 1981: 41). The type of water resources development which has been most common in the West Asia since the second World War has been the construction of large dams with the objective of serving a number of purposes. There have usually included the provision of irrigation water, domestic and industrial water supply, hydro-electric power generation and flood control (Fisher, 1981: 41-45).

A recent assessment of water resources in the Arab League countries by Inter Islamic Network Water Resources Development (INWARD) has assumed a basic demand for water of 55 cubic meters per head per year for domestic water use, plus 1150 cubic meter needed to provide an average daily diet of 3000-3500 kilo calories. The total of 1205 cubic meter of water per head per year was called the lower limit of water requirements. It is estimated that as a result of population growth overall availability of water by the year 2025, will lag far behind demand and only 536 cubic meter will be available of water by then only a few countries in the region will be able to meet even the lower limits of water requirement (Clarke, 1991: 88).

At the most basic level, actual scarcity may be said to exist when real demand exceeds real supply. Although the maxims of supply and demand may determine actual shortages the concept of water scarcity encompasses many discrete but interrelated factors that govern supply for any given demand, climate, perceived and real need, quality, location and reliability of source, consumption, technical capacity, accessibility, demographic growth patterns, distribution of population and water resources, efficiency, organization and management, use of fertilizers, loss and waste, stocks of water and policy decisions on the rate of consumption and distribution. Perceptions of the amount and quality and availability of water are usually a part of a people's attitude toward the environment (Cotgrove, 1982; Whyte, 1986 : 52).

While there are numerous reasons for water scarcity, they all tend to be varied on six basic causes, which taken together, will delimit supply and demand: climate variations, degradation of water quality by human activity at a rate faster than the source can be renewed, depletion of a source, such as an aquifer, at a rate faster than it can be replenished, out-of-basin diversion or storage of surface water, redistribution for other uses or to another place, and consumption. In West Asia these causes stem in one way or another, from a single overriding, immutable determinant of scarcity that accounts for the region's aridity and for that matter of the aridity of other parts of the globe as well (Kolars, 1990: 59).

In West Asia, the composite effects of climate, poor supply, uneven distribution and escalating populations are revealed in exponential discrepancies of water supply per person across the region, ranging from a per capita supply of 115 cubic meter in Libya to as much as 5000 cubic meter in Iraq in rainy years. A disturbing related trend has emerged in recent decades, over the last 30 years; the average available supply of water for the entire West Asia has fallen rapidly from somewhat more than 2000 cubic meter per capita to less than 1500 cubic meter per capita (Kolars, 1992: 103-6; Tvedt, 1992: 14-13).

The region has very little margin of safety where water supply is concerned, especially given a population that is projected to double within the next quarter century. Unless this situation is reversed without further delay, several key actors in the major river basins- Jordan, Israel, the occupied territories, Egypt, Turkey Syria, and Iraq would face a series of destabilizing economic and political crises with the foreseeable future, the consequences of which will reverberate throughout the region. Scarcity, especially mismanaged scarcity combined with uneven distribution contributes significantly to the creation of an environment of uncertainty and instability in the basic political, economic, and social institutions of society, most destructively in situations where the reciprocal factors of ecological marginality and rising poverty obtain-a condition that characterizes most Arab Countries (Al-Rahbi, 1973: 651).

Table -2.3

Water Resources in West Asia (million cubic meters)

Country	Conventional Water Resources					Non-conventional Water Resources			
	Surface water	Groundwater reserve(3)	Groundwater recharge	Groundwater used		Desalinated water	Wastewater	Agricultural drainage	Total
Arabian Peninsula sub-region									
Bahrain	-	-	-	239		56	55	0	111
Kuwait	-	-	-	255		240	103	0	343
Oman	1 450	10 500	955	1 223		34	26	0	60
Qatar	-	2 500	50	286		126	103	0	229
Saudi Arabia	3 210	84 000	2 340	17 000		795	526	0	1 321
UAE	150	20 000	125	1 615		385	102	0	487
Yemen	3 500	13 500	1 550	2 930		9	6	0	15
Sub-total	(4)8 310	130 500	5 020	23 548		1 645	(5)921	0	2 566

Sources: ACSAD, 1997, UNSPD, 1997

2.1: WATER DEMAND IN WEST ASIA

The major cause of the increasing demand for water is rapid population growth. The region's population increased from 37.3 million in 1972 to 97.7 million in 2000 (United Nations Population Division 2001). A high annual population growth rate of more than 3 per cent in the Mashriq sub-region has seen the annual per capita share of available water resources decreasing from 6,057 cubic meter in 1950 (Khouri, 2000: 25) to 1 574 cubic meter in 2000 (Table no-2.4).

Table No-2.4
Water stress index: West Asia

	Mashriq	Arabian Peninsula	West Asia region
Population (millions, 2000)	50.7	47.0	97.7
Available water (km^3/year)	79.9	15.3	95.2
Water used (km^3/year)	66.5	29.6	96.1
Water stress index (%)	83.3	>100	>100
Per capita available	1574	326	974

Source: ACSAD 2000 & United Nations Population Division 2001

Domestic water demand has also been rising due to an increase in per capita consumption. In many countries, water rationing is used to limit demand. For example, Jordan restricts water supplies in Amman to only three days a week. In Damascus, water can be used for less than 12 hours a day.

Agriculture is the main user of water in West Asia, accounting for nearly 82 per cent of the total water consumed compared to 10 per cent and 8 per cent for the domestic and industrial sectors, respectively. In the Arabian Peninsula, agriculture utilizes about 86 per cent of the available water resources, and about 80 per cent in the Mashriq (Khouri, 2000: 21-23). To satisfy water demand, especially for irrigation, groundwater abstraction has increased dramatically during the past three decades.

In the Gulf Cooperation Council (GCC) countries, the total annual water supply increased from 6 cubic kilometer in 1980 to 26 cubic kilometer in 1995, with 85 per cent of the water used for agricultural purposes (Zubari, 1997: 18-22). In 1995, the GCC countries had water resources equivalent to 466 cubic meter year per capita and a per capita water use of 1 020 cubic kilometer per year, producing an average annual water deficit of about 554 cubic meter per capita, provided mainly by mining groundwater reserves (Zubari, 1997: 17-20).

The water stress index in West Asia (expressed as a percentage of water used to available water resources) is more than 100 per cent in five of the seven countries in the Arabian Peninsula, and is critical in the remaining two. These countries have already exhausted their renewable water resources and are now exploiting non-renewable reserves. In the Mashriq, except in Jordan, the water stress index is lower (Table no-2.4 above). While per capita water resources in 9 of the 12 countries in West Asia are below 1 000 cubic meter per year, they are also below 500 cubic meter per year in seven countries. The overall value of the water stress index for West Asia is more than 100 per cent (Table no-2.4 above).

Over the past three decades, the adoption of food self-sufficiency policies has encouraged agricultural expansion. Governments offered subsidies and incentives which resulted in a large-scale expansion of farming, increasing water demand which was satisfied mainly by mining deep aquifers. Furthermore, unregulated pumping, absence or minimal irrigation water tariffs, lack of enforcement measures against unlawful drilling, poor irrigation practices and lack of farmer awareness have resulted in excessive water usage (Zubari, 1997: 17-20).

Intensive agriculture and heavy application of agrochemicals have also contributed to the contamination of water resources. For example, the concentration of nitrates in Gaza's tap water exceeds WHO guidelines (10 mg/litre) and nitrate concentrations are increasing at a rate of 0.2-1.0 mg/litre per year in the country's coastal wells. Adherence to WHO standards would place half of these coastal wells off limits as drinking water (PNA 2000: 4-7).

2.2: WATER ENDOWMENT OF THE COUNTRIES OF THE REGION

Rainfall constitutes an important part of the water budget of most countries in West Asia. However evaluating rainfall is a difficult task. A proportion of such precipitation infiltrates the soil profile and is retained there. Such water, occurring naturally in soil profiles, is among the most precious of all renewable natural resources as it provides the essential starting point in the food chains of both natural and agro-ecologies. Naturally occurring water coming as a free good does not fall equally in volume or reliability on the populations residing on the Earth's surface and the countries and communities of the West Asia are particularly ill-provided (Conway, 1993: 49-62).

The element of National Water Budgets that is most reliably monitored in Arab Countries is gross surface run-off. Surface run-off data can, however provide misleading impressions of the water security of a country. This is because the capability of a water resource to support economic activity and under grid further economic multiplication depends on a large number of associated geographical and economic variables. It is becoming increasingly clear that successful and economically effective development of such surface resources depends on social and political circumstances as much as natural endowment (Allan, 1989b: 47-49).

Geography plays a role, but by no means a determining one. The shape of the terrain and the location and seasonality of rainfall and surface run-off determine whether water can be stored, and together with technology, whether its distribution can be economical. Some of these waters were for a period in the mid-1960s destined for use by Jordan, until the project to transfer the water to the Yarmuk River was interrupted by Israel. Many countries in the region have water in relatively low-lying surface water systems while their main populations prefer to live in high and otherwise more habitable tracts. Jordan's surface water in the Yarmuk and the Jordan rivers represent the majority of national water, but it flows at elevations 1000 meters below Jordan's large concentrations of urban population (Allan, 1989b: 47-55).

Groundwater plays an important role in the provision of water for the countries of the West Asia, but it is a very limited resource. The main feature of groundwater systems is that major aquifers in the West Asia are carbonate aquifers, which are highly fissured and certified. Their main advantage is that infiltration is high in remote areas that receive high amounts of precipitation. However their drawbacks are numerous: high vulnerability to pollution, irregular flow, high losses to the sea, and an intricate surface-groundwater interrelationship. The latter feature favors a joint surface–groundwater development and management. With the exception of the Gaza where absolute supplies are at a dangerous low, Jordan faces the most severe problem. Jordan has renewable ground-water resources of 275 million cubic meters per year, while mining of nonrenewable aquifers amounted to an estimated 190 million cubic metes in 1990 (Salameh & Garber, 1990: 10-14). This situation in combination with the limited supplies of surface water available from the Yarmuk and other streams means that Jordan faces critical water situation within this decade. Its present budget totals about 730 million cubic meter annually, with an estimated need of 1.02 billion cubic meter by the year 2005 (Kolars, 1992: 115).

Lebanon falls at the opposite extreme regarding water supply and demand. Groundwater consumption in 2004 amounted to 487 million cubic meter, and surface water to 637 million cubic meters. Available surface water in major rivers amounts to 3.7 million cubic meters per year. The situation is complicated somewhat by the Orontes, which flows from Lebanon into Syria and thence into Turkey.

Syria, with a 2004 population of 22.1 million people, growing at 4.8 percent per year, faces acute and immediate shortages of water for domestic use in its large cities. It also must provide water for village use and to expand its irrigated lands in order to meet the needs of its growing population. Thus, the problems of water in West Asia come to a focus here (Ellysar, 2005: 3).

Syria retrieves approximately 3.5 billion cubic meters of groundwater from pumped wells and another 2.1 billion cubic meters from natural springs. At present, pumping of ground water is from upper strata and the question of water deep usable reserves exist remains open (Tvedt, 1992: 14-19).

The sharing of the Yarmuk's water has a long history, including the agreement related to the yet to be realized construction of the dam called "Al Wahda" Jordan depends upon the river to supply its East Ghor Canal, vital to Jordanian agriculture. Israel diverts between 50 and 125 million cubic meters annually into Lake Tiberius. Syria in recent years has built a series of retaining dams on the upstream tributaries of the Yarmuk and may be extracting more than 200 million cubic meters annually for its uses. Certainly, the issue of this stream needs to be resolved, despite its small size.

Difficulty regarding the Euphrates and Tigris Rivers has developed with the creation of Turkey's Southeast Anatolia Development project, which may deplete the flow of the Euphrates at the point it leaves Turkey by half within the next 50 years. Recent negotiations between Syria and Turkey have ensured a cross-border Euphrates flow of 500 cumecs, which would suffice for Syria, but would leave far to small an amount to be passed on to Iraq, which also demand at least 500 cumes in the Euphrates as it enters Iraq.

Iraq's population has increased from 18, 8 million in 1990 to nearly 31 million by 2008. Among the three riparian, it has the largest number of people actually living in the Tigris-Euphrates basin (Tvedt, 1992: 14-19).

Mention has scarcely been made of the crisis facing Palestine vis-à-vis Israel, and Israeli use of shared waters. All the nations of the West Asia are involved in that confrontation, and will continue to be influenced by it. Numerous suggestions have been made to bring Turkish water to either Jordan, or to the entire West Asia and the Arabian Peninsula, or to Israel, in the latter case, by sea- born Medusa bags (Fox & Marquand, 1978: 76-98).

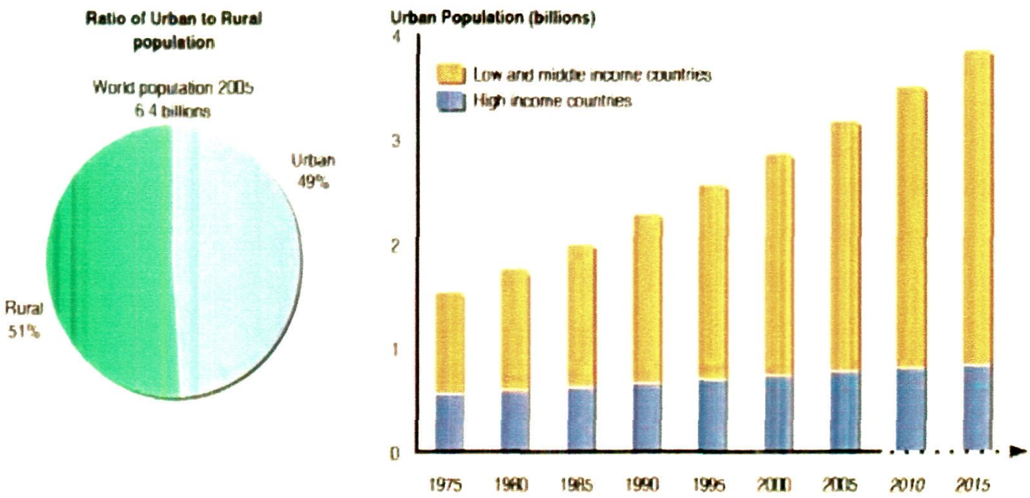
2.3: DOMESTIC WATER USE IN URBAN AREAS

West Asia has long dominated by cities which control their rural hinterlands and were the focal of the extensive international trade system linking Europe to Asia. Urbanization has concentrated large numbers of people in relatively small areas, while the rising standard of living of urban dwellers has meant that per capita water consumption has increased rapidly. The net result has been to put severe strains on the water-resource base and especially on the water resource infrastructure in many regions, besides causing other environmental problems (Beaumont, 1981: 63).

During 20th century most cities have grown rapidly through both immigration and natural increase and their morphologies have been transformed. Generally, the growth of large cities has been more rapid than that of smaller cities, but not without exception, and particularly rapid growth has been experienced by ports and capitals (Clarke & Fisher, 1972: 31).

The diverse significance of cities for populations within the region ranges from a low of around 20 percent in Sudan and Yemen, to about 90 percent in Kuwait and Israel. The higher the per capita income, the higher the percentage of the population that is urban. It is therefore, plausible that increased urbanization and rising per capita incomes are both the result of the economic growth processes and industrialization. West Asian countries have some of the highest birth-rates in the world as well as disruptive rural-to-urban migration, both of which require constantly increasing domestic water provision. The natural growth of the urban population is not the same as is in rural areas since both fertility and mortality rates are lower in urban areas. Thus, since general mortality is also lower in urban areas, it is uncertain whether overall rates of natural growth are lower in the cities than in the villages (Richards & Waterbury, 1990: 266).

Graph-2.2 : Urban Population



Sources: food and Agriculture Organization Statistical Database (FAOSTAT); Country income according to World Bank 2005

One of the most important characteristics of West Asia is undoubtedly, the small amount of precipitation, and the most limiting characteristic in the agriculture of the region is the lack of water. Throughout most of the region rainfall is seasonal, mostly in the winter although in southern Arabia and the Sudan there is summer monsoon rainfall. Only in northern Turkey and northern Iran there is year round precipitation. The heaviest precipitation, 1,500 mm annually, falls along the Black Sea and Mediterranean coasts of Turkey while in most of the upland areas of the region; the average annual precipitation is around 400 mm. In the Arabian Peninsula, southern Iran, Iraq and Egypt, the annual Precipitation is less than

100 mm. In most cases, the rain falling in the mountainous areas is not utilized for agriculture in the areas in which it falls due to the steep topography and low temperatures which cause the precipitation of snow in these areas, thus the water flows in rivers over hundreds of kilometers towards the arid regions of the West Asia (Beaumont, 1985a: 16). Over fifty percent of all the population in West Asia and North Africa either depend upon water from rivers which cross an international boundary before reaching them, or upon desalinized water and water drawn from deep wells (Kolars, 1990: 57).

Agriculture, the largest user of water, is the most important economic activity in the region. On an average, some 30 percent of employed people in the region make their living directly from agriculture, and there is an additional population which is dependent upon agricultural production as a source of raw material for their industrial production. This is still the case, even though the contribution of agriculture of the Gross National Product in all the states of the West Asia has been in constant decline, as has the proportion of the total population employed in agriculture (World Bank, 1992). Most of the states in the region base their agriculture on ground water or water from rivers, the sources of which are outside the state or even outside the region (Allan, 1985: 52). Only relatively small areas such as the valley of the Nile in Egypt and the Sudan, and the Tigris and Euphrates region of Syria and Iraq are irrigated (Underwood, 1981: 53).

In the past 40 years an agricultural revolution has taken place in the West Asia originating in the transition from a traditionally agricultural society to one based on modern agriculture using water on ever-increasing areas. Additional substantial changes in water usage in the region have stemmed from the rapid population growth, in particular since the Second World War (Beaumont, 1980b: 315).

Contrary to this, the shortage of water in the region has been exacerbated by the development of modern irrigation systems which can only be operated with the aid of considerable energy, a feature which reduces the quantity of water in the rivers and leads to an increase in the subsidies to the agricultural sector and especially in the provision of water. The energy subsidies to the agricultural sector especially high due to the enormous costs of transferring the irrigation water to the most fertile soils which are not necessarily found in the areas closest to the sources of water. The model for the development of new irrigated agricultural areas is based on the transfer of irrigation water to previously uncultivated areas or on the improvement of agriculture in areas which once used dry-farming methods. The transfer of river water for irrigation has been made possible through advanced technology introduced over the past 40 years, especially water pumps operated by electricity or diesel engines which have replaced the traditional methods based on manpower or animal power (Beaumont, 1981: 59).

In several instances, the development projects have caused a decline in the amount of water reaching states further downstream because of water utilization for irrigation purposes and the considerable evaporation which occurs in the reservoirs behind the dams, especially in dams built for the sole purpose of creating electricity (Adams, 1985: 72).

Further damage is caused by a rise in water salinity as a result of the increased evaporation and the return of polluted water to the rivers, preventing downstream states from cultivating salt-sensitive crops. The implementation of development plans is in turn greatly influenced by the damage caused to the irrigation systems by inadequate drainage and the increased salinity of agricultural soils (Naff & Matson, 1984: 160). The states must significantly increase cultivated areas and enhance the amount of water to irrigate these additional regions. There is no doubt that adding water for this purpose to the amounts of water currently in use, is not possible (Beaumont, 1985: 318).

The natural growth rates in the region and the significant rise in the standard of living, the food shortage, has continued to grow since the growth rate in the agriculture sector during the last decade has remained at a low level of only two percent. Demand for food products, on the other hand, has increased at the very rapid pace of five percent per annum causing the West Asia to now be one of the world's largest food deficit areas (Fahmi, 1988: 8). The food imports in the Arab world as a whole, increased during the eighties by 700 percent and the annual food imports reached 35 percent of the world total (Underwood, 1981: 53). In this way several of the states in the West Asia have become entirely dependent upon imported food, a situation from which they would prefer to be freed with the aid of development plans (Lawless, 1985: 102).

2.4: IRRIGATION AND WATER REQUIREMENT

West Asia has a rapidly escalating demand for food and a sluggish supply response to the region is considered to be the least food self-sufficient region in the world. Egypt already would need almost twice as many water for its agricultural sector than currently available to be food self sufficient (Richards & Waterbury, 1990: 143).

In most countries of the West Asia the food deficit between domestic production and consumption has increased over the last two decades. Syria was a net exporter of basic food commodities and food stuff in 1960s but in the 1970s, although it still reached self sufficient in barley production it was only 72 percent self-sufficient in wheat production. In the 1980s production lost ground again, and Syria slipped to 84 percent self sufficiency in barley and 60 percent in wheat production. If current level of productivity, continues not only Syria, but most of the countries of the region, will have a deficit in wheat production of 55 percent of domestic needs (Perrier & Salkini, 1991: 279).

Several of the states in West Asia have become entirely dependent upon imported food, a situation from which they would prefer to be freed by means of planned agricultural development. One result has been that food imports have increased government control over strategic urban food supplies (Richards & Waterbury, 1990: 144).

Expansion of food production in water-short areas and in marginal land has made rapid development of irrigation and land reclamation necessary to the degree that water and land resources have often been exploited to their limits. Although agriculture continues to be the largest single user of water, the growth of domestic and industrial water consumption has also increased sharply (Beaumont, 1981: 67). Motivated by fears of growing dependence on food imports, the states would like to increase their cultivated areas significantly and add large amounts of water to irrigate additional regions. However, locating and developing sufficient new water for this purpose is not possible (Beaumont, 1985b: 318).

Subsidies and incentives have led to a large expansion of the private agricultural sector in West Asia, and to the extension of supplementary irrigation into some rainfed farming areas. For example, the total irrigated area in Syria has nearly doubled over the past three decades, increasing from 625 000 ha (10.9 per cent arable land) in 1972 to 1 186 000 ha (25.2 per cent of arable land) in 1999 (FAOSTAT, 2001). In Iraq, the percentage of irrigated land increased from 30.3 per cent in 1972 to 67.8 per cent in 1999 (FAOSTAT, 2001). Irrigation efficiency-the percentage of water that actually reaches the crop-does not exceed 50 per cent in the region, and sometimes falls as low as 30 per cent, leading to high water losses (ACSAD 1997). The water used in wheat farming in Saudi Arabia during 1980-95 was about 254 cubic kilometer (Al-Qunaibet, 1997), equivalent to 13 per cent of the country's total fossil groundwater reserves of 1 919 cubic kilometer (Al Alawi & Razzak, 1994 : 57-73).

2.5: INDUSTRIALIZATION AND INDUSTRIAL WATER USE

Household and even municipal water needs are only a small part of the water supply problem. Globally, industrial water usage is at least twice that of domestic use. Industrial uses associated with the generation of hydroelectric power, the production of steel, chemical and allied products, paper and allied products, mining and petroleum refining (Clarke, 1991: 3).

We need at least three litres of water to produce a tin of vegetables, 100 liters to produce one kilogram of paper, 4,500 liters to produce one tonne of cement, 4.3 tonnes to manufacture one tonne of steel, 50 tonnes to manufacture a tonne of leather and no less than 2700 tonnes to make a tonne of worsted suiting (Clarke, 1991: 3).

The move towards industrialization has enjoyed high priority in government planned expenditure in the West Asia. Alternatively they may be traditional and state capitalist economies, where the state owns or controls most of the natural resources and carries responsibility for large sectors of the economy (Tuma, 1987: 138). The other six countries devoted from 21 percent to 49 percent of their investment budget to industry and manufacturing. This trend continues and is generally expressed as a joint venture between the public and private sectors, with the public sector controlling a majority of the shares (Tuma, 1987: 131).

Energy is considered to be a crucial factor for rapid development and the welfare of society and, as the pace of economic growth increases, energy derives critical importance through the development of energy intensive industries. The bulk of water is used focus for the production of electricity. This use is generally not a problem because there is little consumptive loss and there is usually only the disposal of hot water to worry about. A power station must have a reliable supply of cooling water (a condition that in increasingly hard to meet is some areas) which means that the water power station use cannot be diverted upstream for other purposes, making cooling water a drain on water resources. Taken together, these two uses-industrial use and cooling-amount to more than four times domestic water use and they must be supplied from reliable sources of run-off water (Clarke, 1991: 22).

Table 2.5

Water use in West Asia (million cubic metres)

Country	Domestic	Industry	Agriculture	Total	Water Use(2)	Population (3)
Arabian Peninsula sub-region						
Bahrain	107	19	161	287	515	557
Kuwait	297	13	323	633	374	1 691
Oman	85	6	1 150	1 241	562	2 207
Qatar	85	17	337	439	801	548
Saudi Arabia	2 387	193	18 575	21 155	1 159	18 255
UAE	600	73	1 539	2 212	1 001	2 210
Yemen	470	69	3 280	3 819	254	15 027
Sub-total	4 031	390	25 365	29 786	4 666	40 495
Water use rate(5)	273	26	1 701	2 000		
% of water use	13.7	1.3	85	100		
Mashriq sub-region						
Iraq	1 179	344	47 584	49 107	2 444	20 095
Jordan	245	50	1 088	1 383	257	5 377
Lebanon	415	60	750	1 225	407	3 009
NPA(4)	64	0	155	219	91	2 400
Syria	773	175	13 618	14 566	1 026	14 203
Sub-total	2 676	629	63 195	66 500	4 225	45 084
Water use rate(5)	163	38	3 840	4 041		
% of water use	4	1	95	100		
Regional total	6 707	1 019	88 560	96 286	8 891	85 579
Water use rate(5)	215	32	2 828	3 075		
% of water use	7	1	92	100		

Source: GCC 1996, UNSPD 1997)

2.6: DIMENSIONS OF THE WEST ASIA WATER PROBLEMS

Water supplies in the West Asia are facing enormous pressures and all are already at maximal or near-maximal use. Egypt's population is growing by one million every nine months. Many Jordanian towns get water only once a week. Immigration into Israel is increasing the stress on that country's already taxed water sources. In the Gaza Strip the salination of agricultural lands and fresh-water wells has reached up to catastrophic levels. In Syria, the low level of the Euphrates together with pollution from pesticides, chemicals and salt has forced the Syrian government to cut back on the supply of drinking water and electricity in Damascus, Aleppo and several other cities. Damascus is without water most nights which is estimated to lose as much as 30 percent of its water from old leaking pipes. In Jordanian cities water losses from leaking pipes may have reached to 60 percent (MacMell, 1991: 56-57).

Over 50 percent of the populations of the West Asia depends either on water from rivers that cross an international boundary or on desalinized water or water drawn from deep wells. Two-third of Arabic-speaking peoples in this region depends on river water which flow from non-Arabic-speaking countries and another 24 percent people live in such areas where there is no perennial surface streams. The latter rely either on well water from rapidly depleting sources or seawater which is expensive both to purify in sufficient quantities and to pump to its places of use (Kolar, 1990: 59).

The size of water-dependent populations in West Asia is rapidly increasing. In 1983 the population of this area was 217.4 million, while in 2000 a 119.6 million people would be added to about with figure, an increase of 55 percent. Water will be needed not only for these people as individuals but also for industry and all other urban uses. Irrigation water will also be needed to prevent, as far as possible, dependence on imported food.

(C). WATER SHARING DISPUTES

Disputes over the distribution of the waters of international rivers are a frequent phenomenon of the present century and stem from efforts by riparian countries to control the natural flow of water with the help of modern technology. They also arise from endeavours to secure greater exploitation of water resources. There have been bilateral and even multilateral treaties to resolve such disputes but so far no set system of international law on water resources has been evolved.

As a number of varied factors human, economic and even political are involved in these disputes and the practices of the various states differ. It is especially difficult to solve water sharing disputes unless bilateral considerations are taken into due account and a greater understanding of the interests involved in these should be brought to bear (Bari, 1977: 16-227).

Water has been a problematic issue for centuries in West Asia. This is explained by the fact that water has always been a scarce commodity in this region. The problem is further exacerbated by the fact that most of the waters in West Asia are transboundary that crosses or spans an international border. Indeed, the lack of water or access to it has often led to serious armed conflicts. This is reflected in the Arabic literary legend, "War of the Basoos" a long conflict over water between Arab tribes in ancient Arabia. However, that dispute was resolved once the parties were able to reach a settlement that represented an equitable utilization of the shared resource (Rose, 2006: 63-68).

Today, achieving an equitable and reasonable utilization of a shared resource is only one of the many legal principles parties attempt to achieve when trying to settle water disputes. Additional principles guiding settlement of shared water disputes include:

- Good faith consultation
- Cooperation and negotiation among the parties

- Prevention of significant harm to the water resource
- Holistic approach to the management of surface and groundwater shared resources.

While trying to achieve all these goals to avoid a potential disagreement or to settle an actual dispute may appear idealistic and unattainable. The reality is that water is a life sustaining resource that no person or group of people can live without it nor should be denied or access to this paramount resource. The nature and characteristic of water however present unique and challenging problems in resolving water disputes. For example, "the flow of water ignores political boundaries". In addition to legal issues, scientific, geological and environmental issues are also important in reaching a comprehensive solution and these create a need for an all inclusive approach to water dispute settlement (Rose, 2006: 63-68).

The causes of water conflicts and the mechanisms for co-operation can be clustered according to how the problem of reaching co-operation is defined. For example, understanding this problem as a result of water scarcity has often resulted in technological and market solutions being suggested to increase availability of the resource. Among them are water and virtual water imports (Allan, 2002: 255-272), and an adoption of an integrated system of management (Feitelson, 2003: 45-153).

While some argue that power asymmetry is required for reaching an agreement since the more powerful parties can forge a compromise (Spector, 2000: 223-236) while other counter that a regional power that also holds the position of an upstream riparian is better placed to implement unilateral projects that may become flashpoints for regional conflict (Wolf, 1998: 251-265).

The situation is much more difficult regarding international river basin disputes. Institutional arrangements and precedents to solve-country conflicts exist, but these are virtually lacking for international problems (Marquand, 1978: 45).

It is not surprising that water conflicts develop between countries, have severely strained mutual relations. Many of these are yet to be resolved, like those between India and Bangladesh, Iraq and Syria, Brazil and Argentina Israel and Palestine, Israel and Syria, Egypt and Sudan, Egypt and Ethiopia. Such international conflicts over shared water resources will continue to increase, especially since some writers have already suggested that water, rather than land, will be the major constraint or the critical factor for increasing world food production during the coming decades (Brown, 1976: 21).

2.7: COMPETING WATER DEMAND IN WEST ASIA

In the opinion of several researches, the future of West Asia depends more on water sources than oil resources (Caelleigh, 1983: 22). Nesser Wahabi, the Minister of Social Affair and Labour of Oman, puts a common argument and even if it is based more on emotion than on sound economic evidence it is nevertheless a pervasive and for many a persuasive one: "Obviously agriculture cannot compete at the moment with the lure of the capital area where people can get a guaranteed wage for an eight hour working day and as a result agriculture is suffering. But it is clearly something that has to be sorted out because agriculture together with fisheries, is in the long term more important to this country than oil minerals" (MEED, 1977: 14)

As long as there is joint use of river water systems in the West Asia it is natural for the developing system of relations in the region to be expressed in terms of co-operation or conflict between the states involved. An example of this can be seen in the struggles directed against development works concerned with water resources in the region. Only a small number of agreements to divide the waters of a joint river system among several states have been signed or otherwise settled and those that exist have proved to be difficult to implement, for example, Syria and Jordan signed an agreement to divide the water of the Yarmuk River in 1987 but about 30 million cubic meter of the Yarmuk water reaches Lake Kinneret in Israel annually. It can be assumed that Israel will probably not permit any change in the quantity of water reaching Kinneret, and that Syria will probably not in the event be prepared to give up water to Jordan (Naff & Matson, 1984: 32-36).

The Orontes River rises in Lebanon and flows through Syria to the Sea in the Hatay region of Turkey. Syria and Lebanon reached an agreement over the use of water from this river in 1972 but there is no similar agreement between Syria and Turkey. The Syrians claim that the Hatay region is an integral part of their state which was illegally transferred by the French Mandate to Turkey in 1938. The Syrian's demand for a water division of the Euphrates is countered by the Turks demands for an agreement to divide the water of the Orontes which is used almost entirely by the Syrians. However, such an agreement would bring about de facto Syrian recognition of the area as belonging to Turkey, something that the Syrians are not prepared to acknowledge (Naff & Matson, 1984: 32-36).

Israel and Jordan, both of which currently over utilize their water potential (Frey & Naff, 1985: 67-72) are examples of states whose future development of agriculture will be retarded. In this respect, (Cooley, 1983; Naff, 1991: 17) have presented the external relations strategy of Israel as one which is directed, first and foremost, at answering the country's water needs. These researchers claim that Israel annexed the Golan Heights because it controls part of the Jordan's sources and aims to retain control over this area in the future. Similarly the same researchers claim that, to a large extent the Lebanon War of 1982 was designed to assure Israel's control of the source of the Litani River. These statements, supported by insufficient evidence, indicate the need for more all encompassing research which will examine both the influence of water on regional geopolitics and the influence of regional geopolitics on the development of the river systems.

2.8: THE ROLE OF WATER IN REGIONAL RELATIONS

From the above discussion, it is clear that differences of opinion over the use of river water in the West Asia is one of the most important active issues in regional politics, both overtly and covertly. Overtly, we can see the issue clearly when agreements are signed or complaints filed with the United Nationals or when a military threat is felt. Covertly, the river waters can be seen as an important strategic factor when states in the region consider political manoeuvres and these political manoeuvres influence the development of the river systems (Berber, 1959: 4).

The use of joint river systems and the utilization of their waters is particularly complex from a legal standpoint. International law with respect to water provides a poorly developed framework for international discourse and for the foreseeable future the legal arguments will be subordinate to political considerations. International law is also ambiguous, in for example the interpretation of the principle of 'no harm'. A state's territory undoubtedly includes the water flowing through it "national waters" but national waters flowing in rivers, may reach the territory of another state, becoming the national waters of that state. Water being part of the territory, weather temporary or flowing, makes the definition of the concept "territary" problematic, and raises complex questions in international law (Berber, 1959: 4).

When "unfair" use of river water is made by other states, international law refers to this as "destructive use". "Destructive use" can be caused by a change in the flow of the river in such a way that the water is not returned to the existing system for the use of others, or brought about if an upstream sates uses more than an agreed amount of water. Although some of the water may return to the river system, it may do so in marginal amounts and be of such poor quality, that it cannot be used by the other partners (Naff & Matson, 1984: 158).

Typical of the views held by states which share water systems with others is the claim by an upstream state that its sovereignty is full thus allowing it to use the water within its borders in any way it sees fit without taking into consideration the ensuing effect upon the downstream states. In many instances, the downstream states are those which begin the confrontation, demanding that the historical river flow into their territories continue without any change. The principle guiding international law in such issues is "use your own water so that you do not undermine the use of those using it after you" (Berber, 1959: 13).

Chapter-III

Jordan River Basin

(A). INTRODUCTION

The study discusses the context of water issue between Israel and Arabs and focuses on disputes in particular relating to the Jordan River Basin. Water is a major issue in West Asia as it plays a prominent role in directing political and defining strategies. Four allocations of limited water resources in the Jordan basin region is a major issue. The dispute relates to the sharing of the surface water of the Jordan River Basin among Israel, Jordan, Lebanon, and Syria. In addition to the already complicated issues in any transboundary water dispute, these disputes also involve extremely complex political and territorial issues. The history of these disputes involves, not surprisingly, both armed conflict and peaceful negotiation (Rose, 2006: 63-64).

The Jordan River and its major tributary, the Yarmuk, is the clearest manifestation of hydro politics and the dangers it presents for international river basins. However, since the co-riparian states to the rivers are Syria, Lebanon, the Kingdom of Jordan, the Palestinians and Israel and since all of them have been in a state of war before and since Israel became independent states in 1948. The pressure of the co-riparian states for the limited waters of the Jordan River is enormous, and this has led to over-utilization of the drainage basin. There is no all-inclusive agreement common to all the co-riparian states over the division of the water from the Jordan River System, but there are partial agreements and quasi agreements between pairs of states such as Syria and Jordan and Israel and Jordan. The conflict over the Jordan's water is not one that is in the process of developing, as are the conflicts which are presumed to be inevitable for the Nile or Euphrates-Tigris basins-here the conflict has determined the behaviour of the co-riparian states for almost forty years. The worsening situation of water supply among all the co-riparian states-the result of consecutive droughts and an accelerated population growth-is only going to increase the magnitude of the conflicting interests of the co-riparian sates (Naff & Matson, 1990: 12-27)

The first section of this study will describe climatic and hydro political feature in Jordan River and describe previous efforts to resolve these disputes, including a brief historical review of the background and origin of, disputes. The following section will outline relevant principles of international water Law, which up to now have not played a significant role in efforts to settle down these disputes. The study will suggest all possible inclusive water settlement strategies to resolve these conflicts peacefully (Rose, 2006: 63-64).

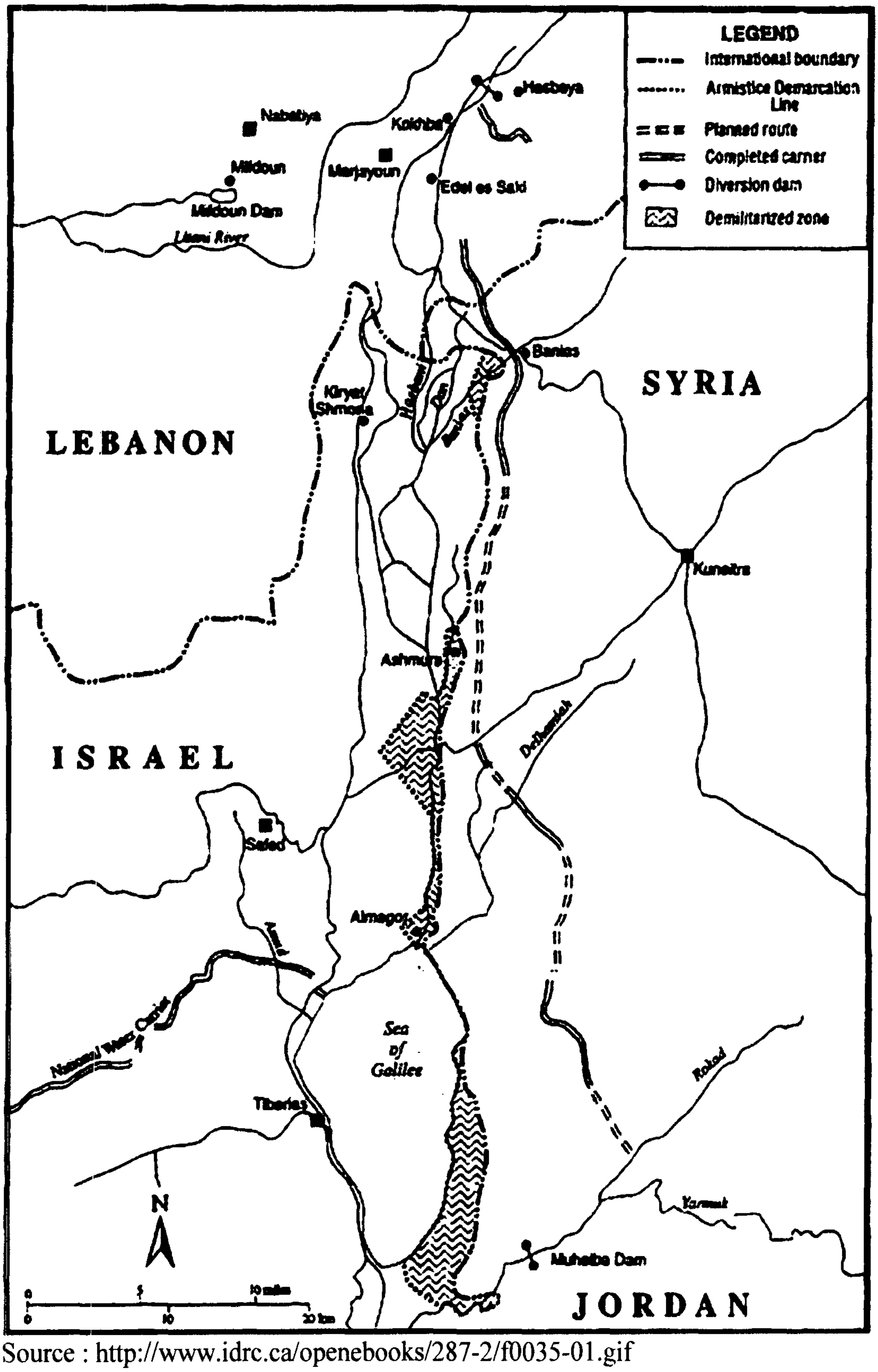
(B). THE JORDAN RIVER

The Jordan River is geologically a young river which was formed some 20,000 years ago during the Pleistocene period. The river is incised in the Jordan graben which constitutes an important component of the Syrian-African Rift Valley. The rift valley within Israel is 400 km long extending from Lebanon in the north to the Gulf of Aqaba in the south (Cressey, 1960: 130; Fisher, 1978: 413).

The Jordan River is the major source of water in Jordan basin. It is the third largest perennial river in West Asia. The Jordan River is a multinational river. It has four riparian states: Israel, Jordan, Syria and Lebanon. The length of the Jordan River is 156 kilometer of which 73 kilometer is under Israeli occupied territory and the remaining in Syria, Lebanon and Jordan (Omar, 1961: 279).

The Jordan River, which flows southward within the rift, rises in the slopes of Mount Hermon and ends in the Dead Sea. The Jordan is made up of the Hasbani Aan spring River and the Banias River which arises in Lebanon and Syria respectively and converges above Lake Huleh to form the headwaters of the Jordan. These two rivers are later joined by the Dan River which arises in Israel. The confluence of these three headwaters forms the Jordan River, which flows into Lake Tiberias. By the time the rivers

BOUNDARIES BETWEEN ISRAEL, JORDAN, LEBANON, AND SYRIA.



Source : http://www.idrc.ca/openebooks/287-2/f0035-01.gif reaches Lake Tiberias it has been augmented by additional flow from the Golan Heights. The total surface catchment area of the upper Jordan River basin is approximately 18,300 square kilometer (Saliba, 1968: 32).

The Yarmuk is the Jordan's main tributary, its flow coming from a watershed divided between Syria and the Kingdom of Jordan, with four – fifths in Syria. After its outflow from Lake Tiberias, in addition to the water which it receives from the Yarmuk, the Jordan also gets water from Wadis on both sides of the Valley. The greater part of this flood water comes from the eastern side; the most important of these tributaries is the Zerqa (Naff & Matson, 1984: 20).

In terms of flow, the largest of the head waters of the upper Jordan is the Dan: on an average, it contributes about 40 percent of the water which flows into lake. It is also the least variable of the headwaters from years to year. The Hasbani and the Banias account for around 20 percent each (Shapland, 1997: 9). Water availability in the Jordan basin region is extremely limited. The Jordan River is the main axis of the system, and its total annual discharge into the Dead Sea is approximately 1,300 million cubic meters. The headwaters of the Upper Jordan 550-600 million cubic meters per year are the Hasbani 117-140 million cubic meter rivers and Dam spring 245-260 million cubic meters per year in Lebanon, and the Banias River 122 million cubic meters in the Golan Heights (Soffer & Kliot, 1991: 10-205). The bulk of the Upper Jordan water is stored in Lake Tiberias (also know as the sea of Galiee or Lake Kinneret), and diverted into Israel's National Water Carrier. The Yarmuk River 450-475 million cubic meters, whose headwaters are in Syria, flows along the Syrian-Jordanian border and through the Adisiyeh triangle which borders Israel, before joining the Jordan River 10 kilometer below Lake Tiberias. Springs, ephemeral Rivers and minor tributaries on the eastern and western rims of the Jordan basin contribute a further 220 and 54 million cubic meters per year respectively

(Soffer & Kliot, 1991: 25-195). The lower Jordan is saline, because of high rates of evaporation in Lake Tiberias which is partially fed by saline springs.

Water is one of the scarcest natural resources in Jordan; only 8.6 percent of the country receives more than 200 mm annual rainfall. This has led to considerable anxiety among Jordanian technocrats about the country's dwindling water supplies. Jordan's population of 4,740 million 2002 and 148 cubic meters per year freshwater and 35,000 migrant workers returning or expelled from the Gulf after the Gulf war, is expected to reach 8.5 m by the year 2015. In additional, Jordan shares its principal water sources with its neighbours on what it regards as unfavorable terms: the Jordan and Yarmuk river with Syria and Israel and ground-water reserves with Syria, Iraq and more problems ethically, Saudi Arabia (Ellysar, 2005: 3).

Jordan's annual water supply is approximately 800 million cubic meter per year 320 million cubic meter of this is from surface water, 270 million cubic meter are from renewable ground water and 210 million cubic meter from non-renewable, the latter being Jordan's strategic resource, abstracted at a rate of 50 million cubic meter per year (Beschorner, 1992-93: 16-17).

Besides this, Jordan has large reserves of fossil brackish water, up to 30,000 years old, which could yield up to 70 million cubic meters per year. In the year 2005 Jordan consumed a total of 1,120 million cubic meters, of which 300 million cubic meters was in the domestic sector, 70 in industry and 750 million cubic meters for irrigation. Jordan's ground water is being abstracted at a rate of 170 million cubic meter beyond its safe yield, which has precipitated the decline of water tables, notably at the Al-Azraq oasis, the main supplier of drinking water to Amman pumping began at a rate of 25 million cubic meter per year but has increased to 250 million cubic meter per year; 50 kilometer from the Jordanian border. At this rate, the reserve will be exhausted after 25 years (Abu, 1988: 148-150).

Per capita annual water consumption in Jordan is one of the lowest in the world, approximately 205 cubic meters, but despite this, water demand began to outpace supply in 1987 and municipal rationing was introduced. Jordan's water deficit in summer 1991 was 210 million cubic meter and 680 million cubic meters in 2015 (Beschorner, 1992-93: 16-17).

Jordan's need for more dams and reservoirs was dramatically illustrated by the winter floods of 1991-92. Existing Dams were overfilled and flooding destroyed the bulk of Jordan's rain-fed crops in the north and 60 percent of crops in the Jordan valley. Plans are under way to raise existing dams and proposals for 15 new storage dams are under study, but much depends on the availability of funds. Jordan is trying to implement an International Monetary Fund (IMF) structural adjustment programme that was severely hit by the Gulf crisis (Libiszewski, 1995: 3-42).

Various options are being explored for increasing the use of marginal water resources: recycled waste water currently yields 35 million cubic meters, the target is 100 million cubic meters by the year 2010 and the establishment of more sophisticated tertiary waste treatment plants.

Jordan eventually hopes to increase exploitation of brackish and sea water, although sea-water desalination is not economically feasible at present, given the high energy and transport network requirements. As Jordan maintained a neutral position towards Iraq during the Gulf war it has been denied aid and low-price energy from the Gulf States (Libiszewski, 1995: 3-22).

(C). CLIMATIC AND HYDROPOLITICAL FEATURES

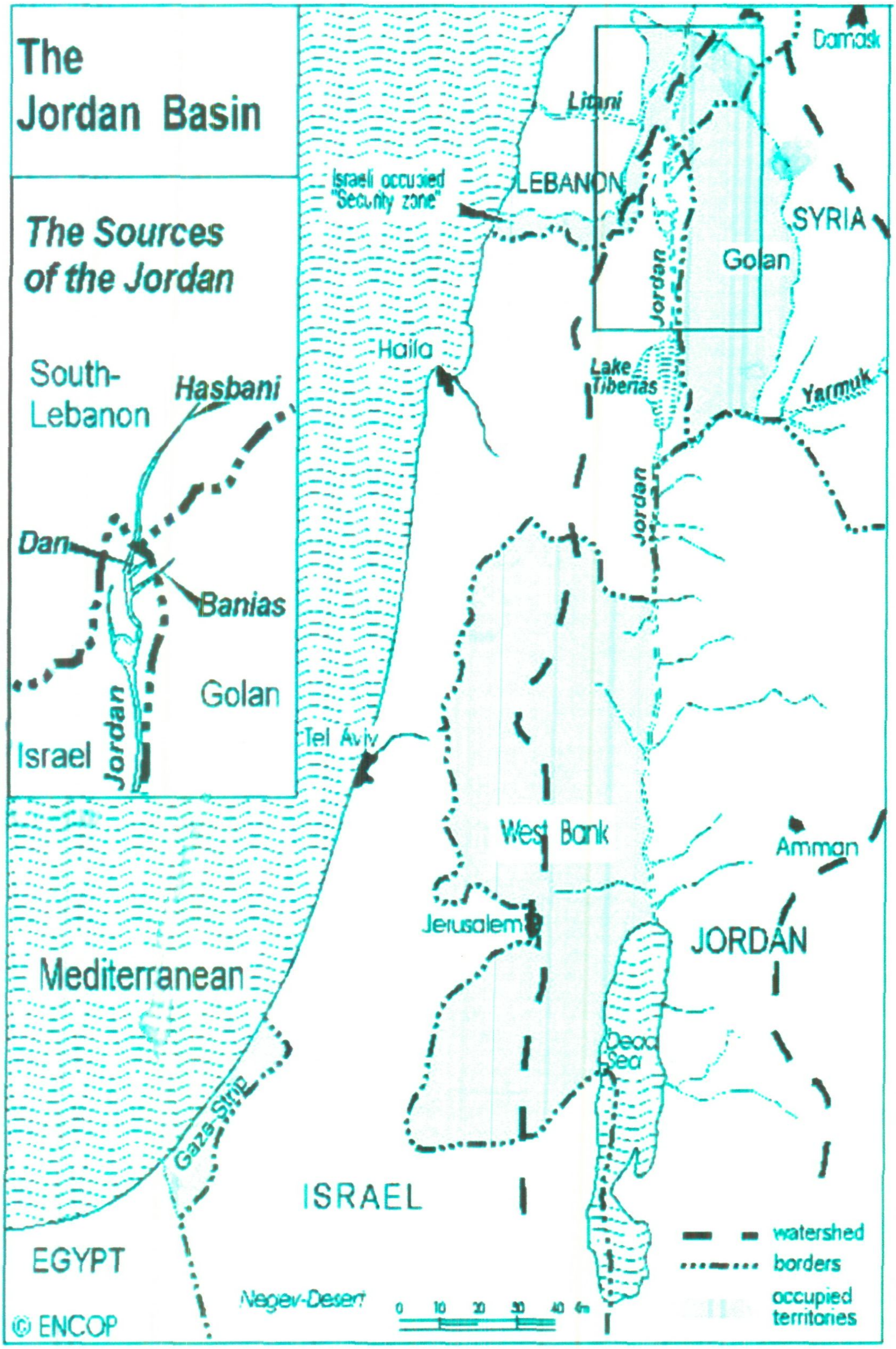
Mountains, dry plateaus, and deserts dominate the landscape of the West Asia. Except for a mountainous belt which stretches across the northern part of the region, the region is generally characterized by aridity and contains large desert and semi-desert areas with small islands of well-watered land (Fisher, 1978: 46).

The rainfall through out the Jordan valley region is meager and highly irregular in distribution. Heaviest totals occur in the northern part of the region and on the more exposed windward slopes. Toward the south the amount of rainfall declines sharply and the seasonal variability increases. In most desert or semi desert regions the rainfall occurs in torrential thunderstorms with the total fall in a single storm often exceeding the average for that month (Blake & Wagstaff, 1988: 83).

The Jordan River is a zone in the West Asia which has two kinds of very different climatic characteristics. First, the environment shared by the riparian countries of the Jordan River experiences a sharply varying seasonal rainfall two distinct seasons predominate in the basin, a rainy period from November through March; and a dry season which extends over the next seven months. Second, there is a marked spatial disparity in the distribution of precipitation over the basin-annual precipitation ranges from less than 25mm per year in the southern part of Israel to more than 1400 mm per year in the mountainous areas of Lebanon and Syria (Murakami & Musiake, 1994: 112-118). This climatologically feature confines about 60 percent of Israel, 50-60 percent of Syria, and more than 85 percent of Jordan to the arid or hyper-arid desert which receives negligible amounts of rainfall, and restricts the main recharge areas of the basin to its northern belt and hills of the West Bank (Beaumount, 1981: 41).

The Jordan River consists of four principal tributaries originating in four countries. Three spring-fed tributaries generate the Upper Jordan: the Dan in Israel, the Hasbani in Lebanon, and the Banias in Syria. The Dan, which is the largest tributary, has a relatively steady flow of around 245 million cubic meter per year, nearly 50 percent of the discharge of the Upper Jordan. The Hasbani, which on average contributes about 138 million cubic meters each year to the river flow, is subject to sharp seasonal and annual variation between 52 and 236 million cubic meter per year. The Banias, which is the smallest River, originates in Syria, less than 2 kilometers from

THE SOURCE OF THE JORDAN



Source : http://mapsof.net/jordan/static-maps/png/jordan-river-map the Israeli border. Its average contribution to the Upper Jordan is 121 million cubic meters per year and, like the Hasbani, It is subject to extreme irregularity (Naff & Matson, 1984: 17-19). The Upper Jordan flows southward into the Sea of Galilee, the only natural freshwater reservoir within the basin. Not more than 10 kilometers down from the Sea of Galilee, the Jordan is reached by the Yarmuk. This is its most important tributary, and contributes 400-500 million cubic meter of water to the basin (Naff & Matson 1984: 20; Lowi, 1993a: 28; Gleick, 1994a: 9). While the quality of water in the Upper Jordan River is very good, the Lower Jordan is mostly saline and by the time it enters the Dead Sea the water, if any, is too salty to use.

The Jordan basin includes Syria, Lebanon, Israel, the Kingdom of Jordan, and the Occupied Palestinian Territories. Among these countries, Israel, Jordan, and Palestinians are suffering from an accumulating water deficit and they are the most dependent riparian on the Jordan River waters. These three states make up the core of the basin for three reasons. First, they incorporate the major part of the catchments area (Libiszewski, 1995: 3). Second, they do not have other surface water resources, and only limited groundwater sources, a fact that make them particularly interested in the waters of the Jordan River basin.

Table No- 3.1

Major tributaries of the Jordan River

Tributary	Headwaters	Annual discharge
Dan	Israel	245-260
Husbani	Lebanon	117-138
Banias	Syria	121-125
Hullah springs and local run off	Israel	180
Yarmuk	Syria	400-500

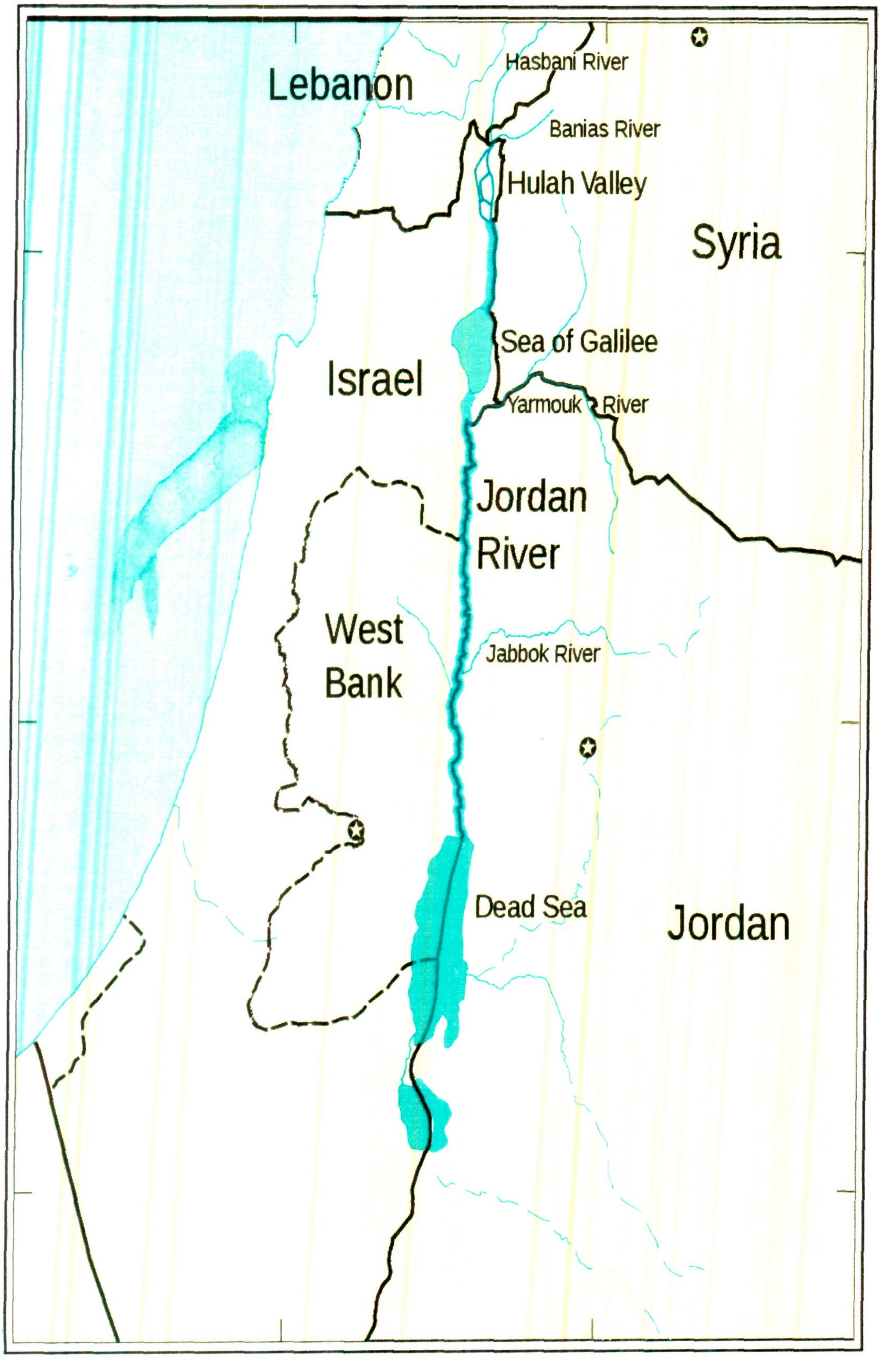
Sources: Naff & Mastson (1984: 17-21); Lowi (1993a: 28); Kliot (1994: 175-80)
Note: a Lowi (400mcm), Naff & Matson (500 mcm)

And, third, they are historically the primary users of the basin's waters- according to (Naff & Matson, 1984: 27), only about 5 percent of the total water demand of Lebanon and Syria is satisfied from the Jordan basin, while the Upper Jordan proper supplies Israel with about one-third of its total water consumption. The Kingdom of Jordan historically satisfied its major water needs from the River Jordan and its tributary Yarmuk. Although after the six day war in 1967, Jordan lost much of its share to Israel, it still uses the river to provide for about 50 percent of its water requirements (Lowi, 1993a: 20).

Syria and Lebanon, because of their claim on two headwaters of the Jordan River, are an integral part of the basin, yet the main part of their territories, and their most important agricultural areas, are fed by other river systems of far more importance. Syria is relatively well endowed with both surface and sub-surface water resources (Gischler, 1979: 113). Syria's total water supply is about 36 billion cubic meters, sufficient for its immediate and foreseeable needs. The bulk of Syria's water demand is covered by the Euphrates, which crosses the country from north to east, and by the Orontes which nourishes the northwest of the country. Currently, the River Yarmuk provides for only seven percent of Syria's total water needs and irrigates about six percent of its agricultural land. Lebanon, for its part, is a mountainous country and almost all of its territory receives adequate precipitation. Moreover, there are several rich internal rivers which create a significant water surplus for the time being and for Lebanon's anticipated needs (Lowi, 1984: 4).

Though Lebanon and Syria may have more water than they require for current uses and at least for the next few decades, Jordan, Israel, and the Palestinians overall water resources is extremely limited, unevenly distributed, and highly subject to climatic fluctuations. It is in these territories that the biblical prediction of seven years of drought followed by seven years of plenty' originated. And this is why in this region small

MAJOR TRIBUTARIES OF THE JORDAN RIVER



Source: http://mapsof.net/jordan/static-maps/png/jordan-river-map rivulets such as the Jordan and the Yarmuk assume importance out of all proportion to their modest discharges (Shahin, 1989; Gischler, 1979: 103).

Based on the current consumption trend, indigenous water resources are unable to meet the growing demand. Further, Jordan shares its principal water sources with its neighbours on terms: the Jordan and Yarmuk rivers with Syria and Israel, and ground-water reserved with Syria, Iraq and more, problematically, Saudi Arabia (Saliba, 1968: 34).

Decades of over pumping have caused sea water to invade Israel's coastal aquifer, a key freshwater source. The degradation of the coastal aquifer greatly deepens Israeli dependence on the aquifers underlying the West Bank. To protect this important source, since 1967 the Israeli government has strictly limited water use by Arabs on the West Bank, while overdrawing the aquifer for its own uses-an inequity that has greatly angered the Arab population (Postel, 1992: 76). Palestinian's quota of 130 million cubic meters per year represents only 20 percent of the rechargeable groundwater reserves of the West Bank, estimated as ranging from 560 to 710 million cubic meters (Naff & Matson, 1984: 47; Kliot, 1994: 247).

The Palestinians demand an equitable share in the water resources of the area. However, the West Bank's main water potential is already fully exploited and Israel cannot increase the amount of water available to it within its pre-1967 borders except by desalination of sea water or importing fresh water from outside the basin (Kliot, 1994: 244).

(D). HYDROLOGY OF RIPARIAN STATES

3.1: SYRIA

Syria with an area of 185,180 square kilometer, about three-fourths and site of the United Kingdom, is the largest of the countries under consideration. While less than a third of its area is cultivable, Syria cannot be said to be densely populated. Hence, land in Syria is plentiful but water supply severely limits its utilization. The area which can support rain-fed cultivation is limited because of the location of the country or rainfall

SYRIA

Source: http://www.worldatlas.com/webimage/countrys/asia/lgcolor/sycolor.htm distribution. The country is divided into several rain-fall zones. Because of its typically Mediterranean climate, Syria is characterized by winter rainfall and summer drought. Generally speaking, the rainfall decreases from north to south and from the coastal region to the interior. The heaviest rainfall occurs along the western exposures of the mountains paralleling the eastern shore of the Mediterranean (Saliba, 1968: 34-35).

In Syria the climate and economic activities are very closely related and dependent on each other. The rainfall in the west is up to 1000 mm in a year. Though most of Syria has an annual rainfall of 250 MMY, rainfall is fairly abundant in the west, where the height of the land tends to determine the amount received (Murakami, 1995: 79).

A third zone affected somewhat by a rain-shadow location parallels the moist arable land to the south and east. Winter rainfall, through slight, is sufficient to support some pastoral activities but is inadequate for crop production. The remainder of Syria falls into the sub-humid or desert classification.

Thus the area which can support rainfed cultivation is confined to a rather narrow belt extending roughly like a crescent from the Hauran in the south northward to Aleppo and then eastward along the Turkish frontier (Saliba, 1968: 35-36).

A major source of water to Syria is the Yarmuk River with an estimated flow of 500 million cubic meters annually. This river is a major tributary of the Jordan basin and therefore of special significance in this study. It is estimated that of the total flow of the Yarmuk, Syria's requirements in that region do not exceed 90 million cubic meter of water to irrigate 18,000 acres in the Yarmuk Plateau, and the Yarmuk valley between Maqarim and Adasiaya (Ghobashy, 1961: 47).

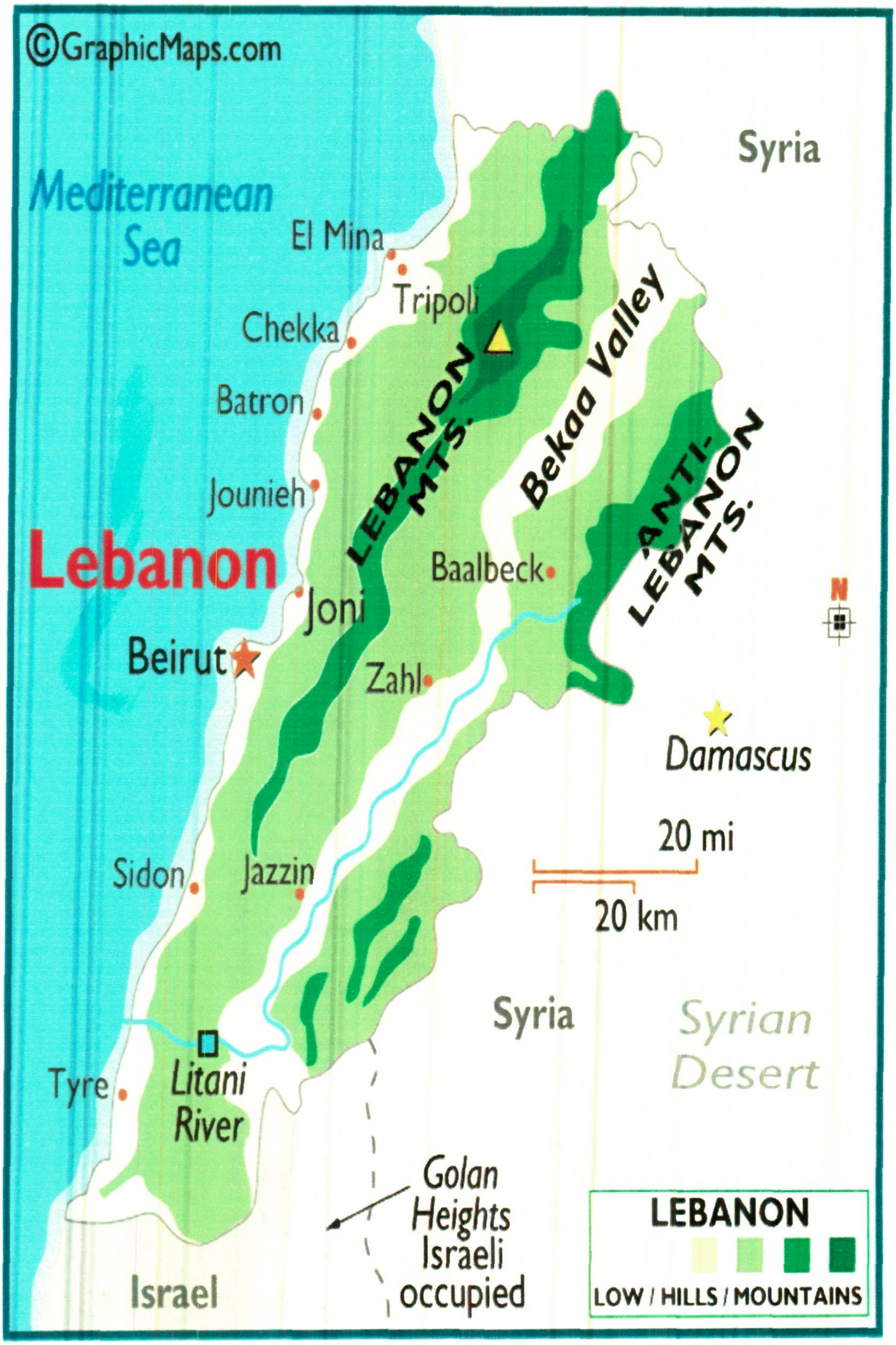
3.2: LEBANON

Lebanon is one of the smallest independent republics with an area of only about 10,400 square kilometer and a population of five million. Compared with the larger Arab countries, it is densely populated, with an average of nearly 945 inhabitants per square kilometer of arable land. It is a mountainous country in which, only a quarter of the land is cultivable. Unlike its neighbouring countries, nature provides for the country as a whole a greater amount of rainfall. This is especially true of the coastal region and the Beqaa valley where the average annual rainfall is about 33 inches (Economic survey Mission, 1994: 28).

Although blessed with abundant water resources, either as rainfall or from rivers and streams, Lebanon, like most of the neighboring countries, experiences recurrent drought problems. This has caused considerable concern in government circles and has resulted in a policy of maximum effort to stabilize and expand agricultural production, through various irrigation and land improvement projects. Today most of the cultivable area is being utilized through the development of various water projects. The most important of these and the key to agricultural as well as industrial development of Lebanon is the multi-purpose Litani River project (Economic survey Mission, 1997: 8).

Lebanese water supplies are seasonal and storage facilities are practically nonexistent. The total water supply of water in Lebanon is approximately 4,800 million cubic meters. There are 15 permanent rivers, of which three are shared by other countries: the Kabir and the Asia draining into Syria and the Hasbani which flows into Israel. The climatic conditions of Lebanon varies according to elevation and distance from the sea. The coastal lowlands are moderately hot in summer and warm in winter and completely free from frost (Beschorner, 1992: 17-19).

LEBANON IN JORDAN RIVER

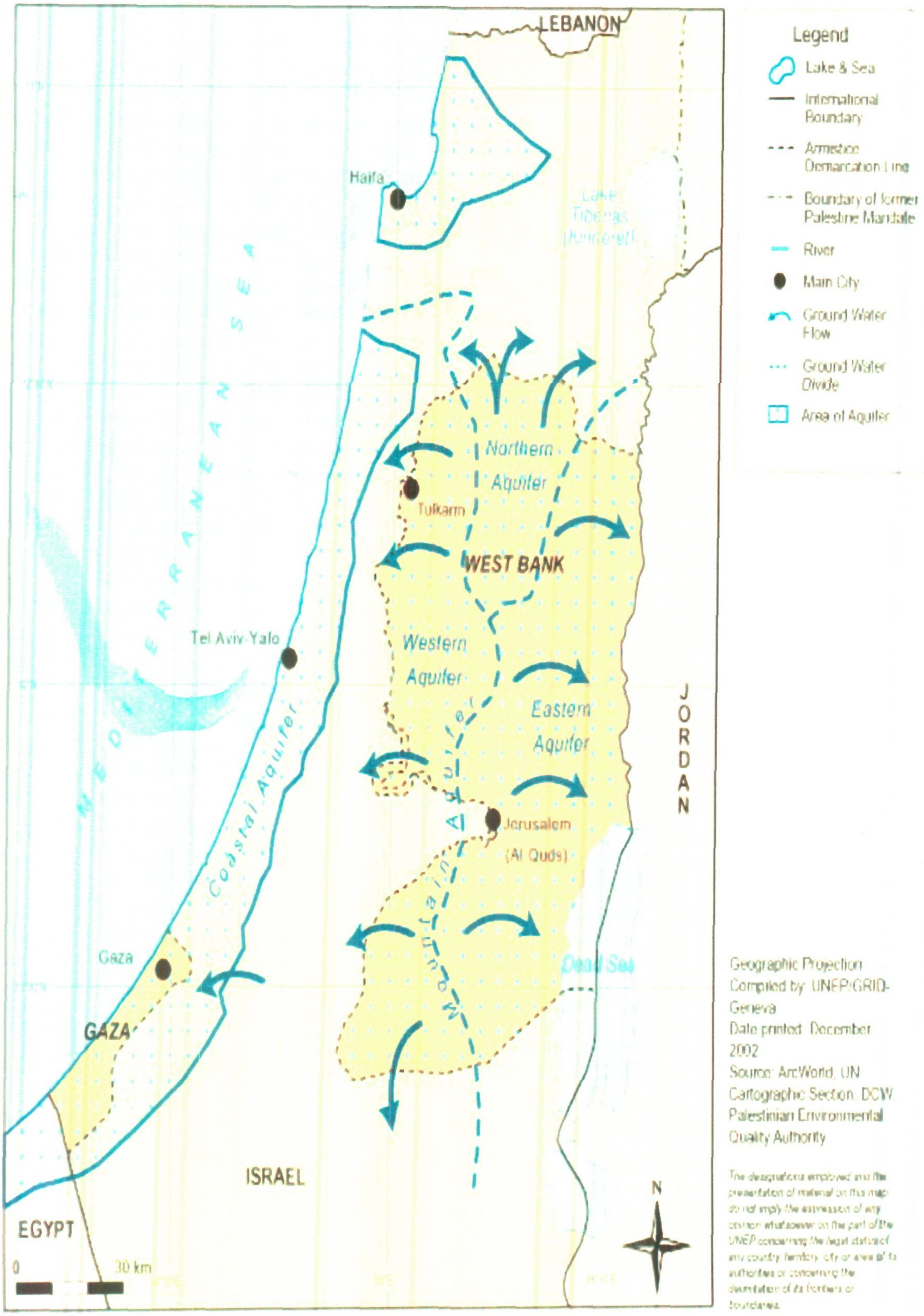


Source: http://www.worldatlas.com/webimage/countrys/asia/lgcolor/lbcolor.htm

It proposes is to develop and irrigate an additional 46,500 acres of land in the Beqaa plain, the coastal plain, and along the intermediate stretch of the river. It is estimated that only 80 percent of its annual flow would be required to irrigate all the cultivable land within the river basin. The remaining 20 percent would be surplus waters (Schmidt, 1955: 6). At the same time the project envisages the development of hydro-electric energy amounting to 626 million Kilowatt-hours annually. Other important irrigation developments under way include the Kasmieh, Ahkar, Yammouneh, and Orontes projects which bring under irrigation an additional 61,000 acres of land (Economic Development in the Middle East, 1945-54: 175-176).

Litani is the most important river of Lebanon, flowing, and the Southern part of the Beqaa Valley along the whole length of the valley until its waters finally turn westwards and enter the Mediterranean near Tyre. The Litani River is about 196 kilometers long and it discharges about 755 million cubic meter of water per year. It rises in the Bekaa Valley, a short distance west of Baalbek and flows south down arise of the Bekaa Valley between the Lebanon Mountains to the west and the Anti-Lebanon Mountains to the east. Unlike the Jordan, Euphrates-Tigris and the Nile, Basins, the Litani basin has almost entirely within the Lebanon. About 80 square kilometers of Syria territory could be considered within the basin and might contribute an unsubstantial amount of winter flood water to the Litani. Nevertheless, there have been numerous discussions regarding possible diversions involving the Litani. In the early 1960s, the Arab states proposed to divert a portion of the Jordan headwaters to the Litani. The most persistent plans have involved Israel. After World War I, the Zionist wished to have the Palestine Mandate extended to or beyond the lower Litani. They have also proposed the diversion of Litani water to the upper Jordan. The purpose was to generate hydro-electricity and Litani water made available for further use. The

MOUNTAIN AND COASTAL AQUIFERS



Source : http://www.grid.unep.ch/product/map/images/palestine-aquiferb.jpg traditional Israel position has been that the Litani is part of the Jordan River system (Saliba, 1968: 34-117).

3.3: THE JORDANIAN KINGDOM

The water reservoirs in the highlands of the Jordanian kingdom north of the Dead Sea form an integral part of the Jordan basin. The water that rises in the Zarqa springs and other streams is included in the river's water balance.

The Arava aquifers lie in the southern part of the Jordanian kingdom and are not connected to the Jordan basin. The Arava aquifer extends from the Dead Sea to the Eilat-Aqaba region. It is divided into: northern and southern aquifers. The total amount of usable water is estimated at 40-70 million cubic meters (Zohar & Schwartz, 1991; Gvirtzman & Benvenisti, 1993: 45-65).

East of Aqaba is another international aquifer, the al Disi basin. This basin may be part of a large underground water body, called the Saq, which reaches as far as Kuwait, and is perhaps connected to the Tabuq aquifer in Saudi Arabia. The potential of this reserve is estimated at 280 million, a cubic meter and it is used by Jordan and Saudi Arabia. The Jordanian Kingdom uses about 100 cubic meter of it annually. Of this, 12 million cubic meters are carried to Aqaba and the rest is pumped for irrigation of Bedouin lands in the Wadi Ram area and to supply Amman. Saudi Arabia pumps about 3 million cubic meter of this water annually (Murakami, 1995: 184-194; Gross & Soffer, 1996: 123-131).

The Jordanian kingdom also has national aquifers: the Azraq basin, in the northeast, which supplies water to Amman, and the al Jafar basin in the southeast.

It is estimated that the potential of kingdom's groundwater reaches 530 million cubic meters of these, 300 million cubic meters of these, 300 million cubic meters are replenish able and 230 million cubic meters are fossil water (Murakami, 1995; Shatanawi & Jayousi, 1995; Gross & Soffer 1996: 119-208).

Table 3.2

Aquifer and Basin Water Status in Jordan (Mm3/year).

Basin	Used	Available
Yarmouk	59	40
Jordan River tributaries	6.3	15
Jordan River plains	21.7	21
Amman and Zarqa	153.8	87.5
Dead Sea	68.6	57
Diesa	56	100
North Wadi Araba	1.75	3.5
South Wadi Araba	4	5.5
Jaffar	23	27 (18)
Azraq	32	28
Sarhan	0.8	5
Hamad	1.8	8

Sources:

The Kingdom of Jordan, one of the driest countries in the world, with about 90 percent of its land receiving less than 200 mm of annual rainfall, has average renewable water supply of 850-900 million cubic meter per year, including groundwater, the Yarmuk, and a few other small surface sources. Being deprived to the opportunity to develop its water storage capacity on the Yarmuk River, this country has been over-utilizing its underground water resources for many years (Soffer, 1999: 132).

3.4: ISRAEL

The state of Israel was established in 1948. It is located at the eastern end of the Mediterranean Sea and covers an area of some 8,200 kilometer. It is an irregular narrow strip about 260 miles long, extending from the hills of

ISRAEL AND THE OCCUPIED TERRITORIES

Source : http://www.grid.unep.ch/product/map/images/palestine-general-mapb.jpg

Galilee in the North to the Red Sea port at Eilat in the South. To the north, it is bounded by Syria and Lebanon, to the east by Syria and Jordan, and to the south-west by Egypt (Saliba, 1968: 42).

Agriculturally and topographically, Israel may be divided into three main regions, from north to south:

- The Jordan valley region which contains the Jordan River and its three lakes: Lake Huleh, Lake Tiberias, and the Dead Sea,
- The central coastal plain, which stretches from a point south of the Lebanese border all the way down to the Gaza strip and
- The southern area of the Negev which extends from Beersheba to the Gulf of Eilat and which comprises more than half of the territory of Israel (Saliba, 1968: 42).

Israel's climate is typically Mediterranean, somewhat similar to southern California. Rainfall is seasonal and is received entirely between November and April. It is heaviest in the north, ranging from 42.5 inches at Upper Galilee to 0.8 inches at Eilat (Tel-Aviv: July 1959: 6).

Thus, as in other countries in the region, irrigation is a limiting factor in agricultural development. In spite of the small size of Israel, there is a great variation in its soils. According to the Soil conservation service of the Ministry of Agricultural, the territory of Israel included seven soil classes, of which 1,320,000 acres were considered suitable for irrigation (Gil & Rosensaft, 1955: 1). The population of Israel increased from 717,000 in 1948 to 4.5 million today (Safran, 1963: 71-83).

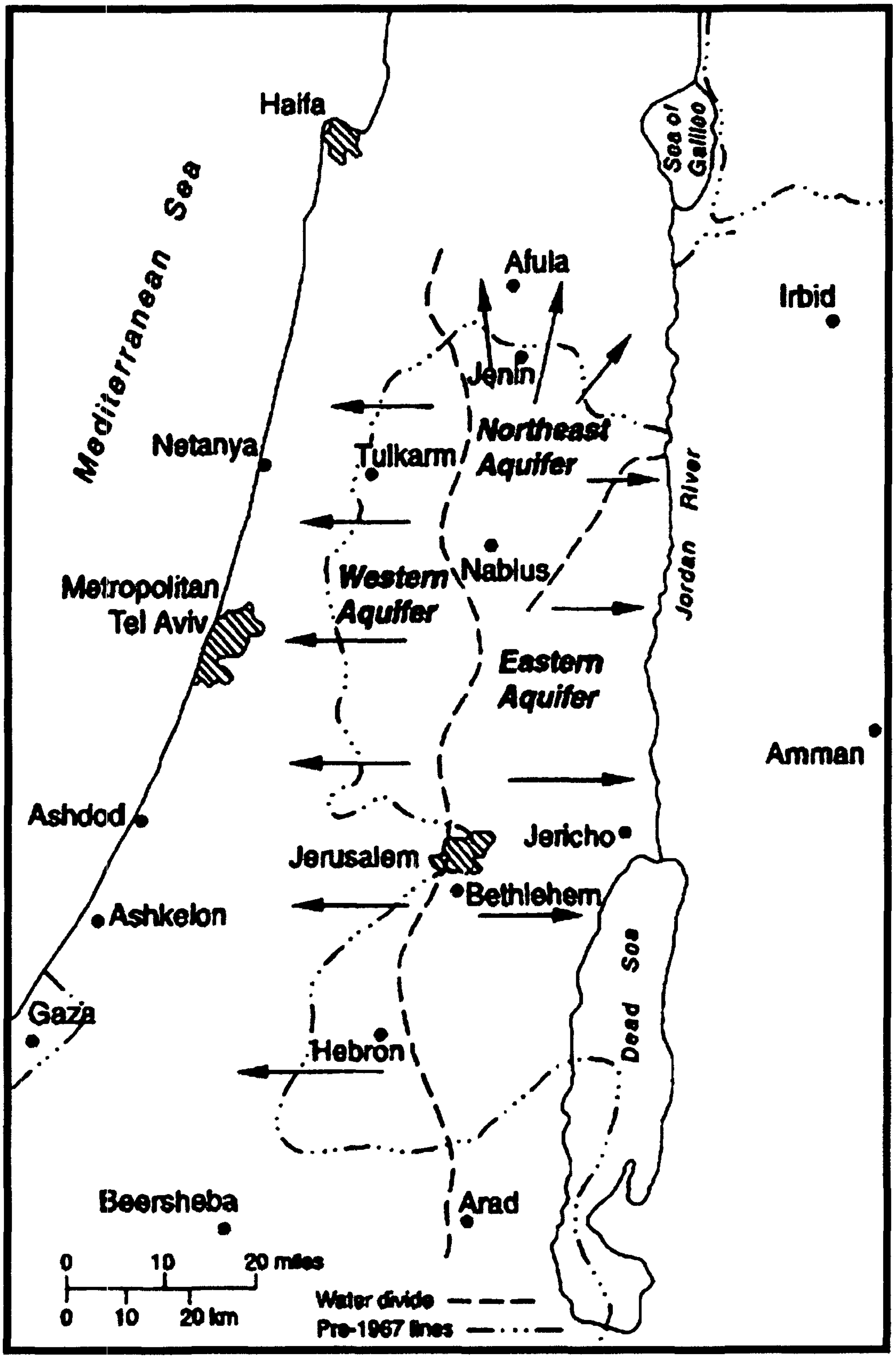
Israel transfers water from the Jordan basin via the National Water Carrier to western portions of the country. Israel is already using 95 percent (of an estimated total of 1755 million cubic meters per annum) of its renewable resources and consumes five times more water per capita than its neighbors. According to the lowest estimate Israel requires about 1750 million cubic meters per annum of fresh water supply.

Although Israel has managed to reduce the amount of water used in agriculture by 15 percent over the last two year, this reduction has not appreciably eased the strain on existing water sources. If estimates are correct Israel by the year 2010 will face shortages up to 800 million cubic meters per annum almost half of its present consumption. Because approximately 75 percent of the water Israel currently consumes is used for agriculture substantial future reductions in water use by the agricultural sector could avert the crisis (U.S. Foreign policy, D.C., December 1987: 12-16).

The agricultural sector has increasingly come to understand that fresh water is a scarce resource that will be largely replaced by treated wastewater and desalination. At the some time, the growing of certain crops may become prohibitively expensive or impossible due to the salinity levels in effluents and available brackish waters (Schwartz, 2001: 39). The transition to drip irrigation for many crops from the 1970s onward has allowed many Israelis farmers to maintain productivity even as actual allocations were cur periodically (Lipchin, 2003: 58-108).

Located on the edge of a desert belt, Israel not only suffers from scarcity of water, but also from its uneven of water resources distribution (Beschorner, 1992: 10). The north of the country provides 80 percent of Israel's water resources, while 65 percent of its agricultural land and the largest cities lie in the south. Its total annual supply of renewable freshwater resources amount to some 1.6-1.9 billion cubic meters, of which about 75 percent is used for irrigation and the balance for urban and industrial purposes. The country's water sources include the Jordan River, natural springs, aquifers, and seasonal local runoff (Murakami & Musiake, 1994: 117). All freshwater sources are already overexploited, including the aquifers of the West Bank; new ways are being developed to exploit marginal water resources through wastewater recycling, cloud-seeding and desalination of brackish water (Feitelson, 1996: 17; Homer-Dixon, 1994a:

PALESTINE WATER RESOURCES



Source : http : //www.google.co.in/imaguri

67). According to Israel's state comptroller, water utilization has exceeded the level of renewable water sources by 200-300 million cubic meters per year and a disastrous deficit of 2 billion cubic meters has accumulated (Kliot 1994: 232).

3.5: PALESTINE

The central highland aquifer stretches from the foot of the Carmel in the north to the Beer Sheba region in the South. It is about 81 miles long and about 22 miles wide, and its depth is 1, 40-3,298 feet below surface. The rock structure that allows water to seep and collect in its is a mixture of limestone and dolomite that geologists Cali "Judean composite". Penetration of water is possible wherever this structure is found on the surface. About 25-30 percent of the rainwater falling on the Judean Mountains infiltrates in to the aquifer, 3-5 percent flow off in streams, and the rest evaporates (Gvirtzman, 1993: 51-56). Over this aquifer lives a population crowded into the cities of Nablus, Jenin, Jerusalem, Hebron Ramallah, and hundreds of smaller settlements. Their sewage, if not treated properly, is easily liable to penetrate into the Central highland aquifer and pollute it.

There are separate water bodies making up the central highland aquifer. The western aquifer, also know as the Yarkon-Taninm, Yields 340-360, million cubic meter of water annually. This is the best water in all Palestine. At present all this water is pumped in a system of springs on both sides of the Green Line. In the past most of this, water rose in Israel (Gvirtzman, 1993: 88).

The northern aquifer, also called Nablus-Gilboa yields a total of about 140 million cubic meter of water. Pumping takes place on two stories, the lower story gives about 70 million cubic meter and the upper about 68 million cubic meters. In the past, before dozens of wells were drilled down to this aquifer, the water emerged in a series of springs in the Bet She'an valley in Israel, and only a small amount of water, 18 million cubic meter, drained to the Wadi Fara' spring on the West Bank (Gvirtzman, 1994: 88).

The third aquifer is the eastern. At present about 100 million cubic meter of water are pumped from it. A considerable part of its water rises as springs, including those of Wadi Kelt, Jericho, Ujah (10 million cubic meter), Fashha (40 million cubic meter of salty water), Ein Gedi, etc. it is estimated that the potential of this aquifer is greater than then amount drawn from it today.

Those three water bodies constituting the central highland aquifer are the most important water source in all Palestine, accounting for about 40 percent of the entire water potential and yielding the best quality water in the country. This aquifer is on both sides of the Gree Line, so its water is international, claimed by Israel and by the Palestinians. The prevention of pollution are of great importance and carry geopolitical implications. The source of the water of this aquifer is largely in West Bank territory Drilling to pump it may be done only in places of water accumulation, and these are not to be found everywhere on the West bank (Gvirtzman, 1995: 95). The estimated average annual ground water recharge in Palestine is 698 to 708 meter per year (648 million cubic meter per year in the West Bank and 50 to 60 million cubic meters per year in the Gaza strip.

(E). GEOPOLITICS OF JORDAN RIVER BASIN

Water is the most prominent issue in West Asia. And among all the water basin of West Asia, the Jordan River basin has been the focus of the most intensive attention. It is also the most frequently cited case among all the water system, in West Asia as a source of serious conflict. The Jordan basin includes Israel and the occupied Territories-West bank, Gaza Strip and Golan Height-Jordan and south western Syria. This region faces the most serious water deficit in West Asia and there is an urgent need to define a mutually acceptable framework of water management (Kolars, 1992a: 82)

Conflict over the Jordan River system has been unmanageable because of two factors:

(1) The system has a complex hydrological structure shared by four riparian.

(2) The Jordan-River involves four hostile riparian states-Israel, Jordan, Lebanon, and Syria. The Arab Israeli conflict has over shadowed efforts to reach agreement on cooperative utilization of the water system (Saliba, 1968: 34).

In the Jordan River basin, water related tension or dispute revolves around the following issues:

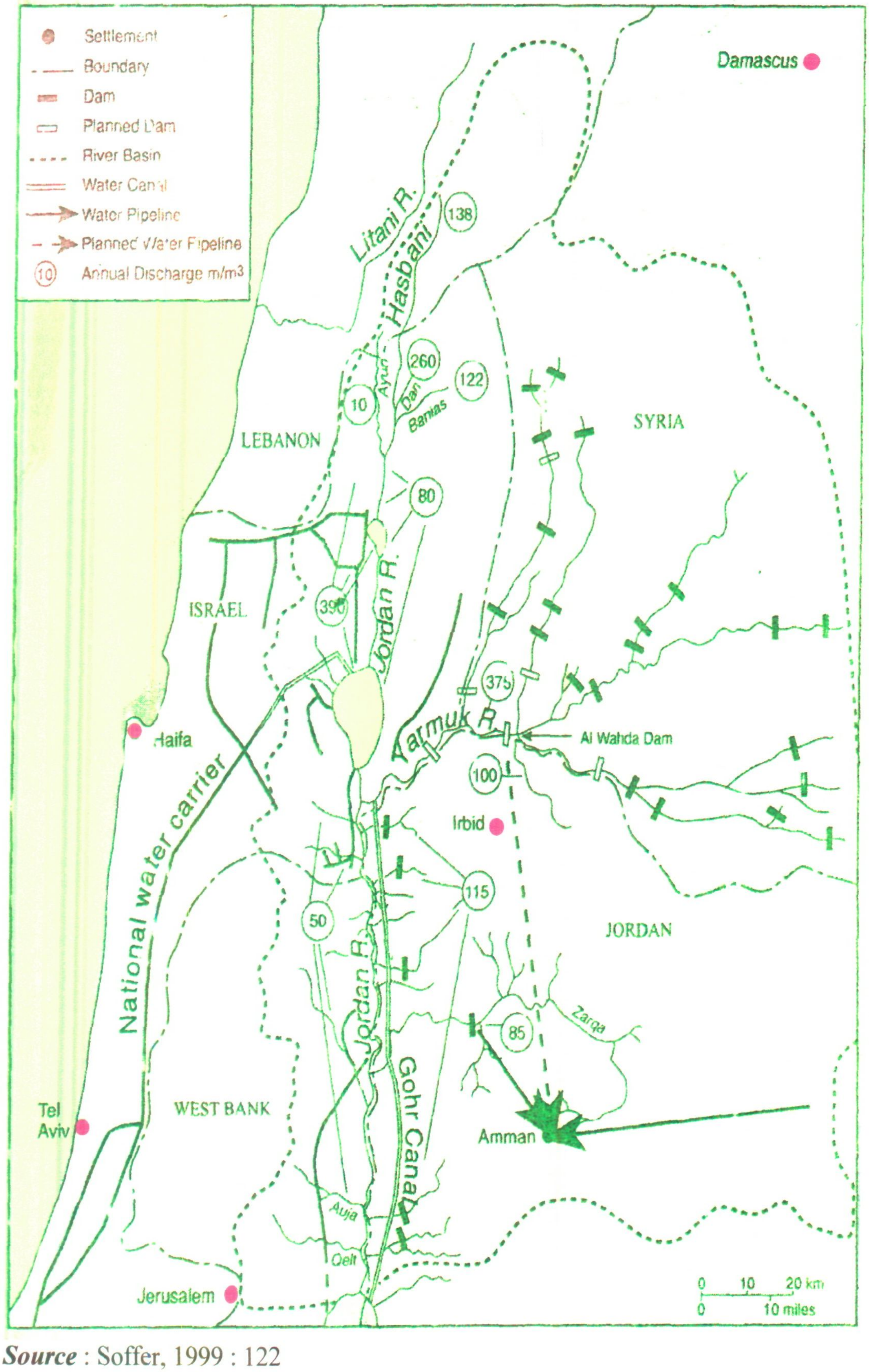
- Israel control over all the headwater of the river Jordan
- Jordanian and Palestinian claims to "historic water right" on the Jordan River
- Syrian plans to build Dams on the Yarmuk River for its own exclusive use.

Water has played a prominent role in directing Israel's policies and defines its strategies. The earliest Zionist leaders of the mid-nineteenth century realigned full well that they could get millions of Jews to immigrate to Palestine unless they expanded their control over the land, which in turn depended on irrigate that land and controlling its resources (Gvirtzman, 1993: 56-88).

3.6: THE EARLY PERIOD

Cooperation between British imperialism and the world Zionist movement regarding this very question can be traced as far back as 1887, when the Palestine exploration fund sent a group of experts and engineers under Sir Charles Warren to Palestine to survey its natural resources, including water. The report published by the group upon its return in 1871 contained the first reference to the Jewish claim that Palestine and the Negev were capable of absorbing millions of people and that water available in northern Palestine could be diverted south for that purpose.

WATER PROJECTS ON THE JORDAN RIVER



Source : Soffer, 1999 : 122

Early Jewish immigration, in the first years of the 20th century, was concentrated in the northern areas of Palestine near the sources of the Jordan River, Lake Tiberias and Beisan. In fact northern water bearing region was the choice of Jews to set up some of their first colonies in Palestine. Since then the Zionist movement has laid down care plans and exploited every opportunity to wrest effective control over the sources of water in the Holy land from its rightful owners. Later after the World War I and during the Paris peace conference, Zionist leaders made efforts to obtain favour for the extension of the northern border of Palestine to the point where it would embrace all the tributaries of the Jordan River as well as the territories bordering the Litani River (Feitelson, 1996: 18). Although they failed to incorporate most of these territories into the frontiers of Palestine, at that time, they were able to utilize their close relations with the British mandatory authorities to develop their water policy with two objectives in mind:

- To obtain all such water concessions for projects, which they planned to exploit in the future and
- To thwart any Arab attempt in Palestine or Jordan exploit water resources that would affect their own future schemes in Palestine (Nimrod, 1966:26).

They obtained the concessions from to mandatory authorities which show the practical implementation of the policy, which included, among other the following:

(1) The Mandatory authorities granted the 70 year company in 1926 to exploit the water of the Jordan and Yarmuk Rivers at the point of their confluence for generating electric power and placed restrictions, on the Emirate of Jordan barring it from making use of the Yarmuk River water for irrigating the Ghor areas with out prior permission from the company.

(2) Concessions granted to Jewish companies to exploit inland rivers in Palestine such as the Yarkon (Awja) River north of Jaffa-Tel Aviv and the Kishon (Muqatta) River north of Haifa.

(3) The concession to drain and exploit Lake Huleh lands. The mandatory authorities and Zionist organizations joined together in pressuring the original Lebanese concessionaries to abandon the scheme and sell their right in 1934 to the Jews so that it could later be exploited to the advantage of the latter.

This brief survey of the measures taken by world Zionism shows clearly the paramount importance the Zionists attached to this issue and underlines their methods of long-range planning to hold such resources in reserve for large-scale settlement schemes, to be exploited fully when the right opportunity arose.

Severe problems cropped up in the aftermath of war as a large number of Jewish immigrants started to arrive in Palestine. The arrival of Jewish immigrants led to an increase in demand for water. In order to meet this growing demand various revised proposal for the utilization of Jordan River were put forth. In 1920 a survey was conducted for the utilization of Jordan's water and its main branch Yarmuk for irrigation and electricity purposes by the British colonial government (Naff & Maston, 1985: 30). But due to increasing tension between the Arab and Jewish people no action could be taken by the mandatory Government (Georgine, 1956: 234).

3.7: THE VARIOUS PLAN

Table No-3.3
Development Schemes for Jordan River System

Year	Plan	Sponsor
1913	Franghia plan	Ottoman Empire
1922	Mavromatis plan	Great Britain
1928	Henriques Report	Great Britain
1935	Palestine Land Development Company	World Zionist Organization Transjordan
1939	Ionides Survey	Transjordan
1944	Lowdermilk plan	U.S.A
1946	Survey of Palestine	Anglo-American committee of Inquiry
1948	Hays-Savage plan	World Zionist Organization
1950	MacDonald Report	Jordan
1951	All Israel Plan	Israel
1952	Bunger plan	Jordan/U.S.A.
1953	Main plan	UNRWA
1953	Israeli seven-year plan	Israel
1954	Cotton plan	Israel
1954	Arab plan	Arab League Technical committee
1955	Baker-Harza plan	Jordan
1955	Unified (Johnston) plan	U.S.A.
1956	Israeli Ten-Year plan	Israel
1956	Israeli National Water plan	Israel
1957	Greater Yarmuk project (East Ghor Canal)	Jordan
1964	Jordan Headwaters Diversion	Arab League

Sources: Abtel Majid Farid & Hussein Sirriyh, 1985:15

Two years later in 1922 Mavromatis plan proposed an elaborate scheme to irrigate the areas of Huleh and drain the marshes. Two dams were visualized for generating electric power and the construction of a canal on both banks of the Jordan. However, like the earlier plan the Movromatis Plan also could not be implemented. A subsequent plan known as the Henrique plan (1928) which proposed irrigating the Yarmuk triangle was also not approved. As Jewish immigration to Palestine increased rapidly in 1930's, the issue became more complicated (Naff & Maston, 1985: 44).

In 1939 MG. Ionides, Director of Development in the transjordan government, for the first time submitted a report on the water resources of transjordan and their development, and irrigable land in the Jordan Valley. It supported the Arab claim that the region's water resources were inadequate to sustain a Jewish state. *Ionides* suggested conservation measures in the side Wadis to improve existing irrigation schemes. The report recommended the construction of an irrigation canal on the eastern part of the Jordan valley. It was to use the water of Yarmuk. In the Jordan valley Ionides Plan was the first hydrographic survey. For the flood waters of Yarmuk the report proposed Lake Tiberias as a storage reservoir (Georgina, 1956: 227-283). It also suggested the use of Jordan waters in the Jordan's own drainage basin.

3.7.1: THE LOWDERMILK PLAN

The Lowdermilk plan published in 1944 visualized the irrigation of the arid lands in the Jordan Valley and the utilization of the channel for development of hydroelectric power. This could be accomplished through the diversion of the waters of the Jordan and Yarmuk Rivers. The plan also envisioned the development of hundred million kilowatt hours of hydroelectric facilities annually (Lowdermilk, 1944: 170-175). The low dermilk plan rein forced the Jewish argument that proper water management would generate resources for four million Jewish refuges in addition to the nearly 1.8 million Arabs and Jews who were already residing in Palestine. To justify this high estimate of water resources, Lowdermilk included the high estimate of water resources, Lowdermilk included the Litani River in his regional management scheme for a Jordan Valley Authority patterned on the Tennessee Valley Authority. He proposed use of Jordan and Litani waters to irrigate the Negev desert, a camel connecting the Mediterranean and the Great Rift Valley to replenish the Dead Sea and generate power, diversion of the Yarmuk River into Lake Tiberias, and gravity flow canals down the slopes of the Jordan valley for irrigation (Cooley, 1983: 2-3; Stauffer, 1984: 12-13).

3.7.2: THE HAYS-SAVAGE PLAN

The Hays-Savage plan of 1948 was prepared by two American engineers at the request of the world Zionist organization to provide the engineering details for implementation of the Lowdermilk Plan.

The Palestinian Royal commission survey of 1946 and the British Colonial Survey of 1945-46 were more in line with the Arab estimates. The British were highly skeptical of the possibility for the cooperation between Arabs and Jews which was deemed necessary for the creation of the Jordan Valley Authority (Lowdermilk, 1944: 180-197).

The Arab-Israeli War of 1948, however, changed the parameters of the debate on Palestine and the UN partition proposal of 1947 ignored the water problem. Once the state of Israel came into expense, the Israeli moved to implement the development of water resources with noticeable speed. The comprehensive All Israel plan was completed in 1951. It included the draining of the Huleh swamp, the diversion of the Jordan River, and the construction of a carrier system. Subsequently consolidation into the National Water Carrier, this plan was to become the keystone of Israel's water development, diverting the Jordan water to the coastal plains and the Negev Desert. The plans define objective was to increase Israel's total water production from 810 million cubic meter of water to 1730 million cubic meter by 1960. Of this 340 million cubic meter were to come by diverting the Jordan River water from Jisr Bount Yaqub in the North to the Negev lands in the (Georgina, 1956: 246).

3.7.3: THE MACDONALD PLAN

The McDoanld Report was submitted by the Jordanian Government with the help of British firm in 1951. It was prepared by Sir MaDonald. It aimed at providing perennial irrigation for the 19.048ha (188,200dunams) on the east of the Jordan from the Yarmuk to Wadi Zerka. The main aim of this plan was the construction of a diversion canal which would flow over the Jordan's plain in the eastern side (MacDonald, 1951: 1-34).

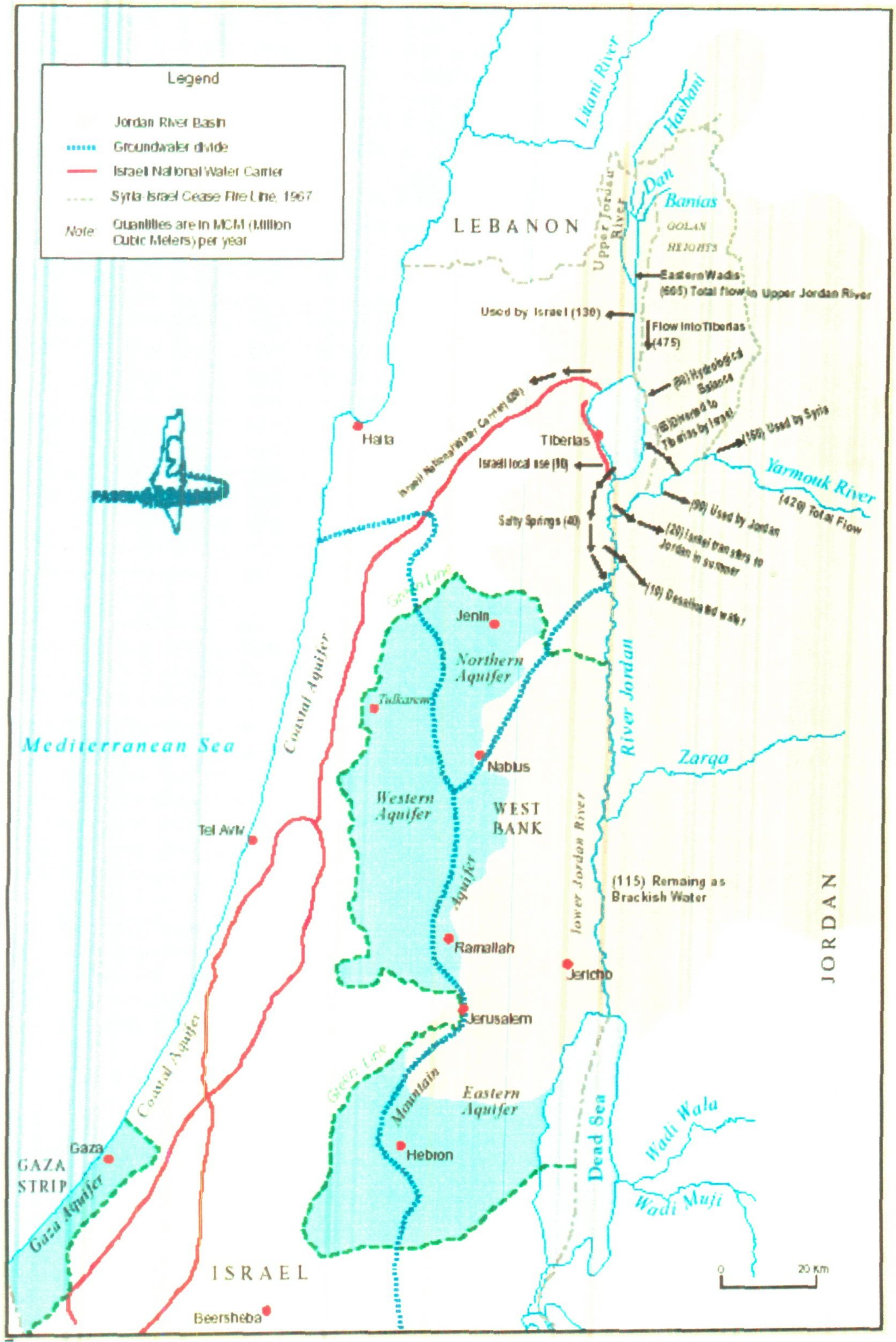
By the early 1950, both the Jordanian government and the United National Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) tried to improve the irrigation schemes of Jordan and resettle the Palestinian refugees. In 1951 Jordanian government submitted a commissioned study from British consultant sir Murdoch Macdonald which proposed diverting the Yarmuk into Lake Tiberias and constructing irrigation canal down both side of the Jordan valley. The McDonald plan has crystallized a basic issue in the conflict relating to use of the Jordan waters; whether or not these should be used within the water shed or outside of it (MacDonald, 1951: 1-34). The McDonald report made apparent the conflicting positions on out-of-basin transfers held by Israel and the Jordan. In the McDonald plan, all water developed would remain in the Jordan valley (David, 1990: 537).

3.7.4: THE BUNGER PLAN

In 1952, the Bunger plan was submitted by United States engineer, Mills E. Bunger. He visualized a dam on the Yarmuk at Maqarin dam with storage capacity of 480 million cubic meters, 65 million cubic meter of which would be used to irrigate land in Syria and surplus of this would be used in Jordan (Ghobashy, 1961: 14). A new proposal was also included in which a canal to lead from the dam on the south bank of the Yarmuk to Adasiya, where a diversion dam would conduct water directly from the Yarmuk river and Maqarin southward into the East Ghor canal and almost to the Dead Sea (Bunger, 1953: 317). Both the United States Technical Cooperation Administration in Jordan and UNRWA evinced great interests in the project.

At this point however, political difficulties came into existence. Spokesmen for Israel in Washington and at United Nation point out that unilateral development of the Yarmuk would diminish the chances for any

JORDAN RIVER BASIN (WATER BALANCE AND USE)



Source : Adapted from the Johnston Plan regional development of the Yarmuk River system (UNRWA, 85: 11). They claimed that Israel as the lower riparian state on the Yarmuk, had a right to use these waters As a result of these Israeli representations, work over the Yarmuk scheme was delayed.

3.7.5: THE JOHNSTON PLAN (THE MAIN CLAP)

On October 16, 1953 President Eisenhower appointed Eric Johnston as a special Ambassador to mediate a comprehensive plan for regional development of the Jordan River system. The plan known as the Unified Plan, based on the Marshall plan in Europe, sought to resolve the conflict by promoting cooperation and economic stability was prepared (David, 1990: 578).

The Unified Plan or base plan was prepared by Charles T. Main on the request of UNRWA and the US state Department and carried and under the supervision of the Tenaessce Valley Authority (Charles, 1953: 4-43). The technical features of the unified plan were as follow:

- A Dam on the Hasbani to provide power and irrigation the Galilee area;
- Dams on the Dan and Banias rivers to irrigate the Galilee;
- Drainage of the Huleh swamps;
- A Dam at Maqarin with 175 million cubic meter storage capacity to be used for power generation;
- A Dam at Addassiyah to divert water to Lake Tiberias and into the East Ghor area;
- A small Dam at the out let to Lake Tiberias to increase the Lake's storage capacity;
- Gravity-flow canal down the east and west side of the Jordan Valley to irrigate the area between the Yarmuk and the Dead Sea;
- Control works and canals to utilize perennial flow from the Wadis; (Doherty, 1965; Stevens, 1965; Saliba; Naff & Matson, 1984).

The main plan favoured primary in basin use of the Jordan water and ruled out integration of the Litani (Cooley, 1983: 2-3; Stauffer, 1984: 12-13).

It was calculated that the area of land that could be irrigated under the plan would be 44,534 ha of which 42,105 ha was in Israel, 49595 ha in Jordan and 3,036 ha in Syria. The quantity of water available for the irrigation purpose of these areas was estimated at 1305 million cubic meter per year, of which 879 million cubic meter of water would based for irrigation in Arab States, and 426 million cubic meters in Israel (Charles, 1953: 4-43).

However the "base plan" of Johnston did face opposition both from Arabs and Israel. They, prepared alternative schemes keeping there interest and requirement. The Arabs responded to the main "base plan" with a scheme known as they Arab plan of 1954. It was prepared by an Arab Technical committee delegated by the Arab League. It reaffirmed the Ionides, Macdonald and Bunger principle of exclusive in-base use of the water, rejected storage in Lake Tiberias, and integration of the Litani. Because 77 percent of the water of the Jordan water system originates in Arab countries, they objected to the quota allocations proposed in the Main plan. The Arab committee proposed that 132 million cubic meter of the total Jordan basin would go to Syria, 35 million cubic meter to Lebanon, 977 million cubic meter to Jordan and 285 million cubic meter to Israel. The Arab plan recognized Lebanon as a riparian of the Jordan River system (Faridi & Hussein, 1985: 15-19).

Table No-3.4:
Water Allocations to Riparian states of Jordan River System

Plan/source	Lebanon	Syria	Jordan	Israel	Total
Main plan	Nil	45	774	394	1213
Arab plan	35	132	698	182	1047
Cotton plan	450.7	30	575	1290	2345.7
Unified (Johnston)Plan					
Hasbani	35				35
Banias		20			20
Jordan (main stream)		22	100	375*	497*
Yarmuk		90	377	25	492
Side wadis			243		243
	-----	-----	-----	----	------
Total Unified plan	35	132	720	400*	

Sources: Abtel Majid Farid & Hussein Sirriyh, 1985: 15

Note: the Cotton plan included the Litani as part of the Jordan River System. Different plans allocated different amounts in accordance with differing estimates of the resources of the system. One major variable in the reporting of the planned allocation is the amount of ground water included in the estimates.

- According to the compromise "gardiner Formula" the share to Israel from the main stream of the Jordan was defined as the "residue" after the other co-riparian states had received their shares. This would vary from year to year, but was expected to average 375 million cubic meters.

(In million cubic meters per year)

3.7.6: THE COTTON PLAN

Israel counter-proposal was elaborated in the plan prepared by the US engineer Joseph Cotton in 1959. The so-called cotton plan reflected Israel's litter indifference to Arab rights and its disdain of any proposal that did not supply in full the needs of it expansionist settlement schemes. The combined annual Litani-Jordan water resources were estimated at 2345 million cubic meter cotton plan also recommended that no less than 1290 million cubic meters be allotted to Israel. The Arab share of 1,055 million cubic meters was to be divided by allocating 575 million cubic meters to Jordan, 450 million cubic meters to Lebanon and 30 million cubic meters to Syria (Faridi & Hussein, 1985: 15-19).

It was evident that Israel was exaggerating its demands in order to pressure Johnston to allot it a greater share; this was what in fact happened. Johnston enhanced Israeli's share from the 394 million cubic meters allotted in his initial scheme to 525 million cubic meters. He again raised the quota to 565 million cubic meter in and 1955, that is, more than the 540 million cubic meters which Israel itself had adopted in its original seven year plan. On the other hand he reduced Jordan's shore from 774 million cubic meters to 720 million cubic meters. Despite Johnston's efforts to convince all sides of the merits of his proposals and despite the inducement of financial and for the schemes he proposed to the states concerned, he failed to obtain the agreement he sought for a joint scheme to exploit the waters of the Jordan valley (Faridi & Hussein, 1985: 25-29).

3.7.7: THE BAKER-HARZA PLAN

In 1955 the Baker-Harza plan for the Irrigation of the Jordan River basin was submitted to the Jordanian Government by two private American Engineering firms Michael Baker, Jr. of Rochester, Pennsylvania, who prepared a land and soil analysis, and the Harza Company of Chicago which made a study of the hydrological conditions during 1953 and 1954. The plan recommended utilization of the Yarmuk and Jordan River water to irrigate 15, 3238 ha in the Jordan Ghor and to provide 167 million kw of power at total cost of $116,874,000. The main intention of the plan was increased agricultural production and futuristic betterment of the Valley. The plan gave 760 million cubic meter water for the development of Jordan, 605 million cubic meter of which was to come from the Yarmuk River and Wadis in Jordan. 155 million cubic meter water was to be diverted from the Lake Tiberias. The plan also proposed the irrigation features construction would cost $216 per dunams or $864 per acre, and operation, maintenance as well as replacement would cost $1.86 per dunums annually. The irrigation scheme would increase net farm income in the Jordan valley by an estimated average $674,000 per annum in the first 20 years. Thus, the ratio of annual increased income to annual costs showed that the project was justified economically (Naff & Maston, 1985: 40-41).

Unified Plan: as negotiations progressed, disagreements were gradually reduced. Israel gave up on integration of the Litani, the Arabs removed there objection to out-of-basin use of waters. Lake Tiberius was rejected by the Arabs as reserves for Yarmuk River. An alternative Arab proposal to treat Lake Tiberias, without diversion of the Yarmuk, as a regional storage center benefits all riparian was rejected by Israel. The Arab demanded and Israel opposed international supervision over with drawls.

Allocation of water quotas was the most difficult issue. After extremely hard barging, the so-called "Gardiver formula" was adopted as the final version of the Unified Plan. The Unified Plan was accepted by the technical committee from both Israel and the Arab League. The Israel cabinet discussed the plan in July 1955 without taking rote (Don, 1955: 409). In 1955 the US once again did not seek to revive Eric Johnston's Unified Plan as the Cotton Plan nor the Baker-Harza plan found acceptance by all the states party to settle the dispute. In July 1955 the plan was discussed by the Israeli Cabinet. The plan was approved by the Arab experts committee in September 1955 and was handed over for final approval to the Arab League Council. In October 1955, the Arab League decided not the ratify the plan because of its serious potential implications sent it back to the technical committee for further consideration (Don, 1955: 409).

Jordan had the following major issues to resolve: the exact amount of water each basin was to receive:

The degree and type of neutral supervision needed for the implementation and the overseeing of the operating of the river system; Johnston, however, was very confident that these issues could be resolved. He submitted a revised version of the Unified Plan which called for the construction of a dam on the Upper Yarmuk River. The 300 million cubic meter of stored water would generate 150 million kwh of electric energy per year (Don, 1955: 402-411).

In October 1955, it was reported that the Arab technical experts had approved the Unified Plan as revised, which, in its final form very much resembled the Arab Plan. Under the revised plan, Lebanon was to receive 35 million cubic meter of water from Hasbani, Syria 132 million cubic meter Jordan of water. As for Israel, except for the above withdrawals and deliveries, the water of the Jordan River would be available for Israel's unconditional use (Don, 1955: 409).

The future to develop a multilateral approach to water management reinforced unilateral development. Though the Unified plan failed to be rectified, both Jordan and Israel ewder took to operate within their allocations. The two major projects under taken were the Israeli National Water Carrier and Jordan's east Ghor canal. The seven-year plan adopted for 1953 was modified and a ten-year plan was introduced in its place.

3.7.8: THE ISRAELI PLAN

The Ten Year Plan of 1956 was sponsored by Israel. The main intention of this plan was to increase availability of water during a ten year period for its 3 million people. It was based on the Hays-Lowdermilk scheme. Israel's Ten Year Plan aimed at exploitation of 700 million cubic meters of waters of Jordan River by Israel through the diversion of Jordan River resources. It would give Israel 56 percent of the river basin's discharge. The main feature of this plan was the diversion of 500 million cubic meters of upper Jordan and Tiberias waters out of the watershed to Negev in the south. Initially, Israel had planned to carryout this diversion through a canal Banat Yaccub, near Lake Huleh. This scheme, the Tiberias-Negev project, consists of a 65 miles long conduit with intermediate reservoir and pumping and booster stations (Edward, 1964: 28).

Israel kept its work on the various sector of this project a well hidden secret. This secrecy was maintained until October 1959, when the Jerusalem post published some details of the project and the work in progress. The Arab reaction was immediate and tension mounted in the early 1960 in the region. This unilateral action alarmed the Arab States and they decided to counter the Israeli attempts to divert the river waters. The Arab League Council met in February 1960 and decided that if Israel went ahead with its plan to divert the Jordan River waters, the Arab would go to ahead and divert its tributaries.

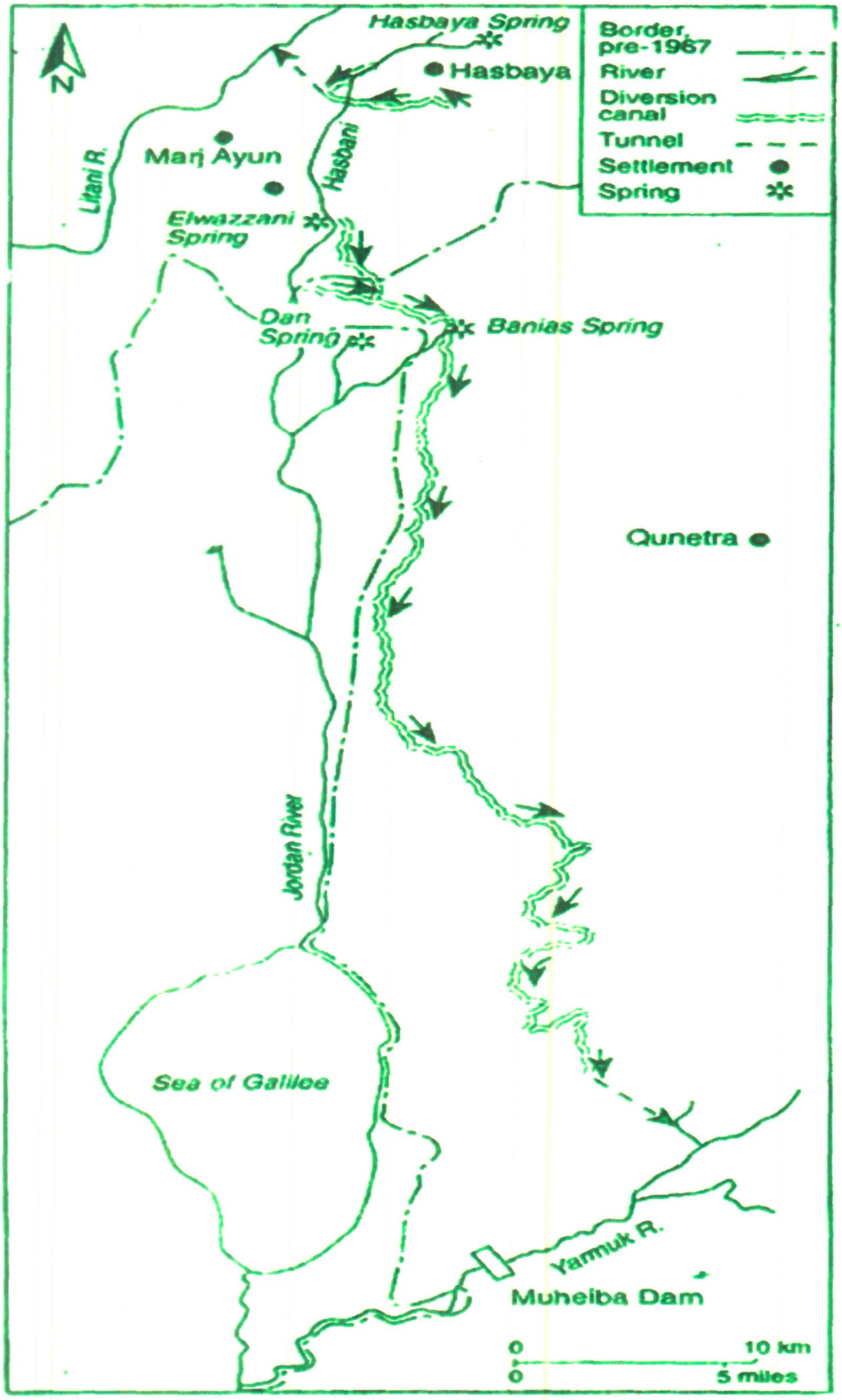
The storm broke once again early in 1964 with the Israel announcement that the first stage of their scheme to convey the Jordan water to the Negev was near completion. In November 1960, the Technical Committee of the Arab League decided the following:

- East Ghor canal would be completed and the Yarmuk water would also be stored in the river valley.
- Diversion of the Baniyas River by canal for irrigation lands of Syria lying to the west, south of the river as far as the Yarmuk (Saliba, 1968: 109).

3.7.9: THE ARAB PLAN

An Arab Summit meeting was held in Cairo in 1964 in order to coordinate a policy aimed at counteracting Israel's action of diverting the water of Jordan River for irrigation. The Jordan River's headwaters originate in Lebanon from the Wazzani and Hasbani rivers (Saliba, 1976: 23-25).

THE ARAB DIVERSION PLAN



Source : Soffer, 1999 : 168

Members of the Arab Summit, therefore, recommended that these waters be diverted to Jordan and Syria. The conference participants under took to finance the scheme and set up a high-level Arab military command to take all necessary measures to protect the project (Saliba, 1976: 23-25).

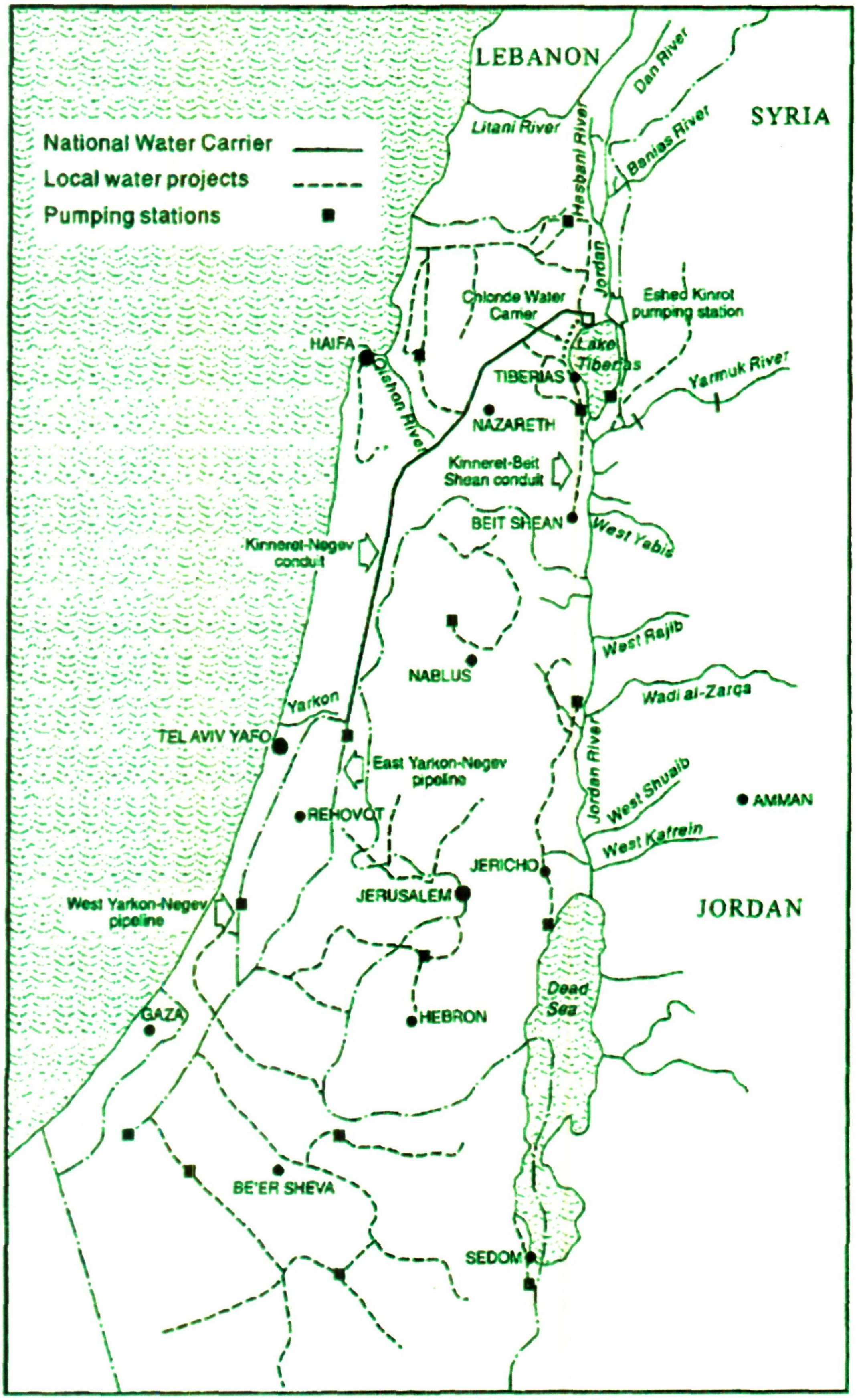
After a second Summit Conference the Arab states finally decided to divert the sources of the Jordan River. This was to be done by the two storage dams on the main tributary of Jordan, the Yarmuk which originates in Syria. This would divert waters into Syria and Jordan, thus preventing Israel a lower riparian state, from receiving any of the Yarmuk waters (Saliba, 1968: 109-110). The Arabs started work on the Headwater Diversion in 1965. Israel declared that it would regard such diversion as an infringement of its sovereign right. In a series of military strikes, Israel hit the diversion work. The attacks culminated in April 1967 in air strikes deep inside Syria. The increase in water related Arab-Israeli hostility was a major factor leading to the 1967 June was finally work on the project of diverting River Hasbani came to a hall. Israel succeeded in foiling the Arabs diversion plan and going total control over all the Arab water feeding the Jordan River and Lake Tiberias (Don, 1964: 293).

The impact of Arab-Israeli politics on the Jordan River conflict reveals only in part of some of the reasons for Arab rejection of any cooperation with Israel in developing the Jordan waters. The waters of the Jordan are vital to Jordan, the West Bank, Israel and the areas in Syria and Lebanon where some of the rivers of the basin rise (Saliba, 1968: 23-24). Dividing these waters, estimated at about 1,500 million cubic meter per year and fluctuating from one year to the next, has been a nettlesome issue from the onset of Zionist colonization of Palestine.

A major feature of Israeli water project was irrigation of the Negev and its articulated policy in the context of water. Yet Israel feels that water resources for it requirements are insufficient. The Jordan Negev water line constitutes the back bone of Israeli defense plans and thereby represents the hydropolitical nature of Israeli water project (Saliba, 1968: 26). As the Israeli bureaucrats suggested, "the main controlling factors in the planning of the Israeli National Water Project are the dispersal of settlements throughout the length and breadth of the state for political and security reasons" (Israel Government Year Book, 1958:6). Israel persisted in the plans to irrigate the Negev by diverting the Jordan River out of the watershed area to the desert. This was the major feature of the National Water carrier Project. The first stage of this project was started almost immediately after the Armistice agreement of 1949 and it gave Israel a partial access to the headwaters of the Jordan (New York Times, 6th October, 1956).

In September 1953, Syria brought the case to the United Nations Security Council and the seriousness of the matter was soon apparent to the world body. Consequently, the United Nation in cooperation with the United States decided that the unilateral plan of each party should be rejected, in favour of regional development of the Jordan River basin (Dulies, 1953: 674-675). During the period of Eisenhower in 1953, Jordan River water development became an important aspect of US foreign policy in West Asia (Khoury, 1964: 20). The US presented a proposal to both the Arabs and Israel for the development of the Jordan basin. This proposal came to be known as the Unified Plan. In 1955 Eric Johnston special envoy of the US set out on his visit to West Asia to help the Arabs and Israelis achieve an understanding on sharing the waters of the Jordan. The Kingdom of Jordan was the first country Johnston visited between 25 to 30 August, 1955 because he saw it as the key Arab country which stood to benefit most from the project (Reguer, 1955: 28). After several rounds of discussion the American finally managed to persuade the Jordanians to agree to the compromise plan. By the end of September 1955 the individual Arab League Technical Committee recommended it to the Arab League's political

WATER PROJECT ON THE JORDAN RIVERS



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Committee. After four days of deliberation the Arab League's political committee decided not to ratify the Unified Plan.

The Arab rejection was basically a political decision and not a technical one. In Syria a new radical government had just come to office and it feared that the opposition groups would force it out of office if it showed the slightest softening of attitude toward Israel. Damascus, also, had little economic incentive to develop the Jordan Valley as it had access to the waters of Euphrates River. Egypt too, under Nasir, was not willing to give any concessions to Israel as this could be interpreted as weakness on the part of the Arab resolve to eradicate the Jewish State (Reguer, 1950-80: 66-69).

3.8: THE NATIONAL WATER CARRIER

With the Arab rejection of the Johnston plan a multilateral approach to Jordan water development and management thus failed. Meanwhile the Israeli Water Authorities, Tahal Engineers and Directors, Mekorot engineers, and special consultants acted together to plan and later execute the National Water Carrier Project. The project consists of a main conduit 105 kilometers long, beginning at Eshed Kinrot on the north western shore of Lake Tiberias, where the water is lifted over 250 meters by pumping. The water then travels over 65 kilometer via canal and tunnel to the Izalmon pumping station and from there to the operational reservoir at Beit Netofa in the Lower Galilee and Menashe Hills. From there the water travels 80 kilometer via 108 inch diameter pipeline, also the coast, to interconnect with the entire smaller reservoir especially that of the Yarmuk, at Tel Aviv until it ends in the northern Negev (Reguer, 1991:65). The total amount of water to be diverted from the Jordan Yarmuk system, according to Israeli authorities will not exceed the amount of water allocated to Israel under the Unified Plan.

Israel remained determined, with or without Arab cooperation, to divert part of the Jordan River waters for irrigation. Consequently in 1956 the National Water Carrier project for irrigating the Negev was approved and work began in 1958 (Kahhaleh, 1981: 30-31). In early 1958 the east Ghor Canal project was announced, and the United States-after satisfying herself that Jordan would tacitly adhere to the Johnston formula-granted the kingdom a $4 million grant through the agency for International Development to complete it. In the early 1960's the Technical Committee of the Arab league formalized a plan to build a dam on the Hasbani relaying its water to the Litani via a tunnel, and to divert the Baniyas southwards to the Yarmuk (Rizk, 1964: 29-30).

In 1964, the construction was finally started for a dam on the Yarmuk and for diversion of the headwaters of Jordan. After Israel started test pumping in May, a second Arab Summit Conference was called at Alexandria in September 1964 at which it was decided to build a dam on the Yarmuk at Mukheiba to store water diverted from the Baniyas and Hasbani (Naff & Maston, 1984: 43). With the outbreak of the Arab-Israeli War of June 1967, work on the project of diverting River Hasbani and on implementing the proposed for irrigation came to a halt (Hoff, 1985: 35-39).

3.9: THE 1967 WAR

The 1967 War increased the trend towards competition unilateral utilization of the Jordan River system Israel improved its hydro strategic position through the occupation of the Golan Heights and the West Bank. The occupation of the Golan Heights made it impossible for the Arab states to divert the Jordan headwaters. The 1967 ceasefire line gave Israel control of half the length of the Yarmuk River compared to 10 kilometer before the war.

Table No-3.5:
Water-Related Ceasefire Violations in Jordan River System from 1951 To 1967

Date	Incident	Immediate Issue	Underlyind issue	Resolution
Spring 1951	Shooting in DMZ, both sides invade, Israel expols Arab villagers from DMZ, Isrel air force bombs al-Himmah	Arab resistance to Israeli land seizure, expulsion from DMZ	Huleh drainage in DMZ	Security Council orders return of Arabs, but villages had been razed
9/3/53	Shooting in DMZ	Water diversion by Israel in DMZ	Sovereignity over DMZ	UN order work halt, US threatens to end aid, Israel moves intake out of DMZ
12/12/55	Israel hit Arab villages NE of L. Tiberias, lill 50 (follows by two days firefight on lake)	Fishing rights	Israeli saboteurs captured (1954) inside Syria	Security Council condemns Israel, Syria says no to Johnston plan, prisoners return two months later
1/31/62	Israel destroys Lower Tawafiq in DMZ	Israeli drainage ditch in Arab	Use of land	Syria complains to MAC Israel boycotts
11/13 64	Patrols, exchange of fire, bombing of Tell el-Qadi (source of Dan R)	Road building by Israel in disputed territory	Sovereignty over source of dan R.	Both parties complain to security Council, Soviets veto
1/1/65	Fatah hits pump station (first in series of attacks on Israel)	Israeli existence	Palestinian self determination	None
Spring 1965	Patrols firing on Israel-Syria boder	Road building by Syria in Golan Heights	Arab water diversion	None
7/14/66	Israeli airforce bombs Syrian construction vehicles, air battle at Banias	Alleged Syrian provocation	Arab water diversion	Security Council discusses, takes no action
8/15/66	Exchange of fire on Lake Tiberias	Patrolling, fishing	Land use in DMZ	Syrian note to Security Council
4/2/67	Firefight in DMZ	Arab water diversion	Arab water diversion	None
4/7/67	Israeli airforce bombs Golan, seen over Damascus	Arab water diversion	Arab water diversion	MAC reconvened, no action

Sources: Abtel Majid Farid & Hussein Sirriyh, 1985:18

During the 1967 War, Israel captured the Golan Height from Syria. The Golan Heights, itself has little water resources to offer except the Baniyas river a small tributary of the Jordan. Israeli water strategy has been at the heart of its campaign to retain permanent control of the Golan, since it would assure protection of Israel's Lake Tiberias pumping works. More important, control of the Golan Heights enables Israel to preempt any Syria or multilateral Arab effort to divert the upper Jordan back to Arab territory or to develop Yarmuk (Majeed, 1985: 54-55). In addition Israel has occupied the northern bank to the Yarmuk River boundary between Syria and Jordan, opposite the intake tunnels to Jordan's East Ghor Canal. Had Israel seized the Hasbani in 1967 it would have completed the job of securing the source of Jordan River. With the Dan River inside Israel proper, and the Baniyas captured in June 1967 by Israeli, only the Hasbani lay beyond Israel's grasp (Star, 1973: 289).

3.10: THE JORDAN-SYRIA EFFORTS

In the changed scenario, and early in 1972 the Jordanian government formed a committee composed of representatives from various related ministries and departments, to formulate a comprehensive three year plan for the rehabilitation and development of the area. To coordinate and implement various schemes envisaged, a special law was passed early in 1973 setting up the Jordan Valley commission which was soon elevated to the Jordan Valley Authority (JVA) headed by a president of ministerial rank (Reguer, 1991 : 76).

In 1987, Jordan and Syria decided on a project to share the run off waters of the Yarmuk River. The plan was initiated by Jordan for which the West bank was expected to provide funds from Israel. The Israel demand was to participate in the planning, construction and administration of the dam. Basically Israel wanted a share of any additional water that would come as a result of the project. Israel also wanted to prevent the Jordanians from doing any thing that would block off water to Israel (Rodan, 1995: 2).

3.11: THE WATER AND PEACE TALKS

Water was a prominent factor at the West Asian Peace talks which began in Madrid in 1991. In subsequent rounds of peace negotiation among different parties, held in Moscow, Vienna and Washington, little headway could be made over the problem of sharing water resources of the region. Syria and Lebanon were unwilling to discuss any issue relating to water until Israel withdrew from the occupied territories. As water is crucial to the survival of the Jewish state, Israel needs to control the Yarkon-Taninim reservoirs which are located on the West Bank. If these sources are handed over to Palestine, it would sharply reduce the water availability in Israel and would make the latter dependent on the emerging Palestine entity (Dadwal Roy, 1996: 472). When negotiation began the Palestinians started claiming their right to water, and reallocation of supplies. The Israeli government was unwilling to give major concessions. While it agreed that the Palestinians could use little more water, it refused to give up over all control. The Israeli water commissioner was in favour of cooperative use of unused resources and the production of additional water by building desalination plant and coordination of effort to control water degradation problem. Israel stated, if a Palestinian state comes into existence, Israel must control the 2-6 kilometer wide hill ridge in the Anabta region since most of the source of ground water are found in the region (Beschorner, 1992-93: 23).

In the Vienna round of multilateral negotiations held in May 1992, the Jordanians, Palestinians and Israelis agreed to cooperate and exchange data on water resources. The Jordanian condition was such that, water utilization must be user-related and accord should seek to move from a position of disparity to equitable allocation of water (Beschorner, 1992-93: 24). In May 1993 the third round of multilateral negotiation were held in Washington. A working group on water resources has met seven times, since then which was set up in Washington. In September 1995 an interim agreement was signed wherein, for the first time, the Palestinians were accorded a right to west Bank ground water. The accords also setup a joint Israeli-Palestinian committee to manage water affairs in West Bank (Rodam, 1995: 2-3).

The absence of Syria and Lebanon from the talks has effectively limited the number of areas of potential cooperation and thwarted hopes that full and all encompassing cooperation among the riparian state of the Jordan basin would be developed. In addition, the varying concerns of the regional participants and their differing expectation of this process have burdened the discussion and impeded greater break through. In particular, much of the discussion, especially in the early rounds, flounced over the inclusion of water rights as an agenda item. Israel has sought to separate the technical and political aspects of the water issue, regarding the primary object of this working group as to focus solely on technical issue and joint water management, with the aim of increasing the overall supply of water within region. The formulation of solution to the problems of water supply, in the Israeli view, requires the development of a range of functional and technical links between regional experts and officials. The construction of these links should not be impeded by the discussion of water rights and shares which, for Israel, is essentially political issue and therefore should be confined to the bilateral negotiations (Prters, 1996: 17).

Some progress has been achieved despite fundamental differences, essentially because the Israeli position on the appropriate for a for the discussion of water rights has prevailed. The water working group has confined its activities to developing strategies for managing and increasing the supply of water in the region, and has concentrated its efforts an identifying the appropriate methods to supply adequate water to growing population at an affordable cost? To this end, the parties have focused upon four broad themes, adopted at the first plenary meeting in Vienna, as the starting points for discussion and potential cooperation;

- enhancement of data availability
- water management and conservation;
- enhancement of water supply; and

Concepts of regional cooperation and management.

In the course of these talks, the parties have become increasingly the aware of need to translate their deliberation into identifiable achievements and move towards the implementation of specific projects (Prters, 1996: 18).

The disputes relates to the sharing of the surface water of the Jordan River basin between Israel, Jordan, Lebanon, Syria and the Palestinians of the West Bank. In addition on the already complicated issues in any transboundary water dispute, these disputes also involve extremely complex political and territorial issues. The history of these disputes involves, not surprisingly, both armed conflict and peaceful negotiation (Lowi, 1993: 193).

At the end of World War I, the League of Nations entrusted Great Britain with the Mandate for Palestine, which was comprised of the areas now referred to as the West Bank, Gaza, Israel and Jordan (United Nation, 1917-1988: 48).

After the creation of the state, the Israeli government began the elaboration of a national water plan, along the lines of schemes drawn up during the Mandate. The Israeli plan was development towns and agricultural settlements were built. Over 250 of the new settlements which were established within five years of Israel's independence and promote a closely interlocked rural and urban economy, industry and services were brought into previously unpopulated areas (Feitelson, 1996: 18).

The effect of Arab-Israeli politics on the Jordan River dispute explains only in part some of the reasons for Arab rejection of any cooperation with Israel in developing the Jordan waters. Equally important is the role Played by inter-Arab politics and rivalries and the relation of the Arab refugees to the problem (Saliba, 1968: 78). So water had now gained a security dimension. Having acquired and ideological, demographic, and economic significance, the water question had now become a strategic issue-a matter of national security and foreign policy. The failure of several proposals concerning the regional water-sharing arrangements in this period confirms the fact that water was involved in foreign policy considerations of both Arabs and Israelis (Dolatyar, 1995: 35-43).

The political, social and economic, impact of the Arab refugees on the Arab host countries which could result from Arab acceptance of the Unified Plan. One of the implications of an Arab acceptance of the Unified Plan would be the implied Arab acquiescence to the fact that the Arab refugees are to be settled in the Arab host countries instead of being repatriated to their homeland (Don, 1958: 24).

It was reported that the Arab technical experts had approved the Unified Plan as revised, which, in its final from very much resembled the Arab Plan under the revised Plan, Lebanon was to receive 35 million cubic meter of water from Hasbani, Syria 132 million cubic meter Jordan of water (Don, 1955: 409).

The fact that the engineers on both side of the conflict agreed that the Unified Plan was the most economical and efficient plan ever to be proposed for the Jordan, and the fact that these engineers agreed on the amount of water to be allocated to each of the riparian states, amounted to an assertion by the United states that the Unified Plan was also the most equitable (Saliba, 1968: 87).

In northern Israel, the National Water Project was linked to development and settlement plans in the Huleh swamps, reclaimed by Israel in 1951. According to the Syrian view, Israel was not allowed to foster any major changes in these areas. Tensions between the two countries exacerbated as Israel kept insisting on her right to engage in agriculture in the entire Hulh area (Yaniv, 1987b: 163).

Table No-3.6

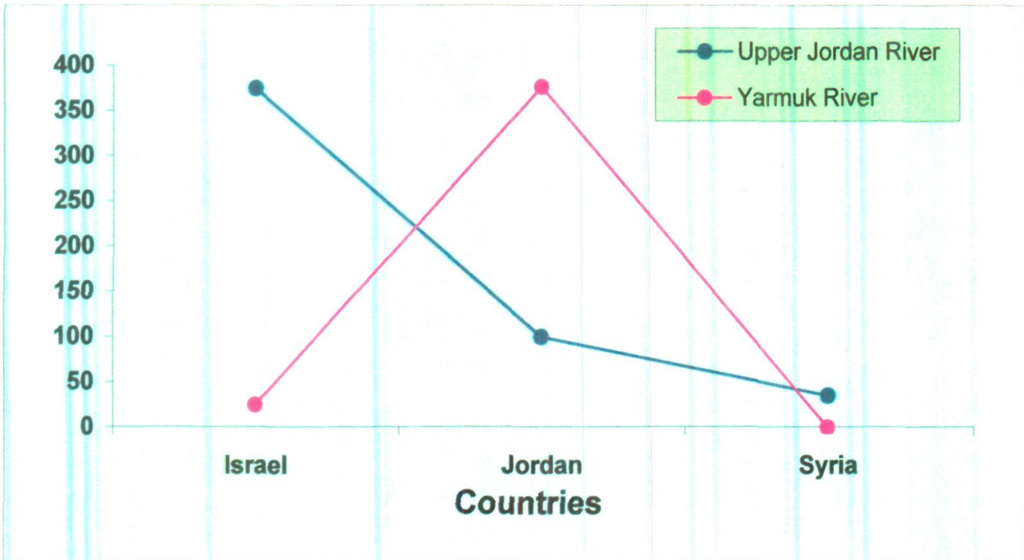
Water allocations according to Johnston's Unified Plan of 1955

Country	Upper Jordan River	Yarmuk River	Total
Israel	375*	25	400
Jordan	100	377*	477
Syria	35	--	35

Source: Libscewski, 1997

*According to the "Gardiner Formula" Israel's share of the main stream of the Jordan River and Jordan's share of the Yarmuk were defined as the "residue" after the other co-riparian states had received their fixed share. This would vary from year to year, but was expected to average 375 million cubic meter of Israel and 377 for Jordan. Jordan would also get 243 million cubic meter from side Wadis in the lower Jordan valley which were not shared resources in the proper sense at the time, since Jordan itself was the sole and last riparian on that track of the river.

Graph – 3.3: Water Allocations According to Johnston's Unified Plan of 1955



The Johnston Plan was the first attempt at drawing up a development Plan for all of the Jordan River basin. Israel, Jordan and Lebanon approved of it, but Syria did not, which in turn hindered Jordan and Lebanon from endorsing it. Neither did the Arab League come out in favour of the American proposal. Although the Johnston Plan was never fully implemented, owing to political disagreements the proposed allocation has served as a guideline for the affected states and, in fact, many of the principles stipulated in the Plan have been followed by Israel as well as the Arab states (Anderson, 1988: 10).

After the establishment of the Jewish state, Israel asserted state ownership of all natural resources under its control. This legislation abolished de facto ownership and control by landowners or villagers over local wells (Feitelson, 1996: 18) in order to provide the legal framework for the operation of a national water system and there by over come the extreme imbalances in water availability across the country. It central artery, the National Water Carrier, completed in 1964, brought water from the north and central regions, through a network of giant pipes, aqueducts, open canals, reservoirs, tunnels, dams and pumping stations, to the country's urban centers and to the agricultural settlements as far as the Negev Desert.

To the Arabs, Israel's National Water Carrier became a symbol of aggressive expansionism, to which they responded with their own diversion plans (Cooley, 1984: 14-18). This Israeli overreaction to the water issue led Arabs to presume that they had found the Achilles heel of their enemy. The first military action of the Palestinian National Liberation Movement targeted the Israeli National Water Carrier (Zarour & Isaac, 1993: 41). The project, decided in 1964, was part of a broader anti-Israeli campaign which had been provoked by Israel's announcement that the beginning of pumping into the National Water Carrier was imminent. Technically difficult, with water to be pumped as high as 350 meters, and economically inefficient, the Arab Plan was clearly politically motivated. The diversion would have cut the installed capacity of the Israeli carrier by one third and increased the salinity of Lake Tiberias, thus collapsing Israel's water supply system (Wolf & Ross, 1992: 937).

Israeli leaders repeatedly warned the Arabs that the Jewish regarded the continuity of the water flow as a matter of vital interest, and the Israeli army and air force attacked the work sites of the project several time between 1965 and 1967 (Lowi, 1993: 125).

Israel's control of the West Bank was the most important new element introduced by the war of June 1967 into the Arab-Israel hydropolitical equation. In the case of the Banias, Israel had already shown before the that it was capable of using military force to prevent neighbouring countries from constructing diversionary work to deprive it of water (Pearce, 1991: 21).

Immediately after the end of the 1967 War, Israel destroyed 140 Palestinian water pumps in the Jordan Valley and made it difficult to obtain permits for new wells. After this destruction, the Israeli army declared the area in the West Bank near the Jordan River a military-security zone and thus prevented many Palestinians to get to their farm land (OSLO, 1995: 17).

- The Israeli policy in the occupied Palestinian Territories consists of
- Limiting Palestinian economic development through limiting the water available of Palestinians and
- Closing all doors to a just and real peace with acceptable and implementable political solutions. These policies have left the Palestinians without hope. It has also forced them to leave their land and migrate to neighboring Arabic countries or work as cheap unskilled labour in Israel (OSLO, 1995: 1-4).

Palestinians in the West Bank and Gaza strip have an intermittent water supply system, namely they get water in the system only twice a week only and then for only 2-3 hours. Water quality has been altered by such a water supply system. Based on Israeli military orders a Palestinian cannot build any type or size of water infrastructure without the written permission of Israeli authorities (OSLO, 1995: 1-17).

The issue boiled down to the question: who had the ultimate sovereignty over the West bank and the River Jordan? Jordan and Syria argued that the quotas in the Johnston plan were linked to 'specific destinations', that is, related to state sovereignty; while Israel maintained that it was she who now administered the western Jordan valley, and that by virtue of the occupation and the Jewish settlements, Israel had a right to pursue claims on the Yarmuk and the West Bank waters, and the right to higher water quotas because she now administered the Golan and the West Bank (Nijim, 1990: 321).

The Israeli authorities pointed to the inefficiency of the traditional forms of irrigation in the West Bank, suggested that the Palestinians could increase their agricultural production without using more water by adopting modern methods and argued that the Palestinians had no ground for complaint, since there was no increase in the volume of water allocated to agriculture on the Israeli side either (Shapland, 1997: 23).

The equalization of occupation with state sovereignty, as well as the historic use' argument Israel has claimed a right to be a party in, for example, the Jordanian water project of the Maqarein Dam as well as the irrigation plans for the Ghor (Nijim, 1990: 24).

What is perceived as a greater security threat to Israel is not the territorial claims of Palestinians on West Bank but the already over drawn water resources which could further worsen in case West Bank goes to Palestinian control. This explains the reason why Israel is not willing to reason why Israel is not willing to relinquish its suzerainty over West Bank. As a result, the Israeli could be denied access to the portion of water supply which it is till data dependent on, and intensive pumping of aquifers flow into Israel beyond the Green line (Lowi, 1999: 385).

Jordanian Plans were also a danger to Israeli industries using bromine and potassium plants. These industries depended on Dead Sea minerals, but with Jordanian and Israeli exploitation of the River Jordan, the level of the Dead Sea has decreased, adversely affecting the industrial complex. Israeli and Jordanian development projects, the lower Jordan River has become a drainage ditch with very little water flowing into the Dead Sea (Reuger, 1993: 79).

The Canal Project heightened Jordan's fears that pumping water from the Mediterranean to the Dead Sea would damage Jordanian agriculture, which is irrigated with water from the East Ghor Canal. So Jordanian and Israeli interests conflicted, highlighting their joint dependency on the, same water resources.

King Hussein's hostile statements against Israel in 1990 were related to a Jordanian application to the World Bank for financial support for the Wahda Dam on the Upper Yarmuk River. The Dam would be of the utmost importance to the water supply in the Jordan Valley, which suffers severely from chronic water shortage. The policy of the World Bank, however, is not to grant such funding unless all riparian to a water project approve the plan. Israel feared that the Wahda Project would affect her ability to cope with increasing water needs, and thus refused to approve it, while Syria agreed (Starr, 1991: 23f).

In the period 1983-85, agriculture amounted to 15.9 percent of Gaza's total GDP, a decrease from 28.8 percent in 1968-70 (Kahan, 1987: 14). Furthermore, Gaza's agriculture is based to a large extent upon citrus fruit, with a high demand for water (Kahan, 1987: 26).

In the late 1970's and early 1980's efforts were made, once again, to reach a cooperative solution for developing water resources in the regions. This time, damming of Yarmuk River was objective. The Maquarin Dam project was planned as a Jordanian-Syrian irrigation and hydro-electric scheme based on joint exploration of Yarmuk waters for the benefit of both sides of the common border. The US government under the carter Administration immediately took an interest in the Maquarin Dam project. The US made condition to help Jordan with financial assistance for Dam, if Jordan got approval of the Syria and Israel. Israel negotiated for larger allocation of Yarmuk water than what Jordan was prepared to offer. But Syria was not agreed on trilateral water sharing plan with Israel. Thus, regional conflict hindered in resolving the international river basin disputes (Lowi, 1995: 131-132).

The June 1967 Arab-Israeli war, caused in large measure by tension arising from the water crisis, put a Sudden and final end to the Arab League's diversion plan. In a period of six days the amount of territory controlled by the Jewish state tripled. The Golan Heights, the balance of Mandatory Palestine and the Sinai peninsula all the come under Israeli occupation with the seizure of Baniyas stream by Israel in 1967 the water crises itself lost much of its urgency (Leslie, 1970: 16).

Two of these parties, Syria and Lebanon have been unwilling to date to participate in any multilateral or bilateral talks to address the possibility of peace let alone a joint management water project. In addition to these serious obstacles, there is no single agreement between all the riparian that covers the basin as a whole.

In essence, the dispute concerns the amounts of water taken out of the basin by the riparian. Israel controls the vast majority of the waters of the Jordan River basin and utilizes the largest share. The other riparian also utilize water from the basin, but essentially complain that Israel's consumption is not equitable. In addition nearly all the parties are engaged in hydro-projects that have or will have impacts on the basin (McCaffrey, 2002: 45).

For example, Lebanon is currently diverting water from the Jordan River basin via the Wazzani springs between Lebanon and Israel. Lebanon claims that it is entitled to continue pumping water from the springs under international law, and that the diversion supplies from the Wazzani springs adversely impacts Israel's water supply, and in 2002, Israeli prime Minister Ariel Sharon announced that the Lebanon's diversions represented a" cabus belli. Needless to say, tensions are high over these waters (McCaffrey, 2002: 55).

In 1951, Syria and Lebanon considered a scheme to divert the flow of the Hasbani and Banyas tributaries to the Litani in the Beqa'a Valley of Lebanon. In the early 1950's, both the Jordanian Government and the U.N. Relief and Works Agency for Palestine Refugees in the Near East (UNWRA) began working on separate irrigation schemes to improve Jordanian agriculture and to resettle the Palestinian refugees (Rouger, 2000: 111-112).

Table No-3.7

Jordan and Yarmuk River distribution before and after the Israel-Jordanian peace Treaty of 1994 (in million cubic meters)

Jordan River

	Israel	Jordan	Source/Effective Data
Johnston Plan 1955	375	100	
Early 1990 (defacto)	550	0	
After the Peace Treaty	550	+10 +20 (+40)	Pesalinatedsprings (Lake Tiberias) / immediate Dam on Lower Jordan/Long term From Lower Jordan, brackish/long term, insecure

Yarmuk River

	Israel	Jordan	Source/Effective Data
Johnston Plan 1955	25	377	
Early 1990 (defacto)	70	130	
After the Peace Treaty	25-70**	130 +20 (+25) (+50)	Existent Lake Tiberias(exchange)/immediate Byexistingfacilities/immediate,amount,insecure From Planned Dam/ longterm, amount insecure

Additional Sources

	Israel	Jordan	Source/Effective Data
After the Peace Treaty	Not referred to	+50	Sources to be yet defined/very long, highly insecure

Sources: Libszewski, 1997: 80

** As long as the planned Jordanian dam on the Yarmuk is not realized, Israel will presumable be able to catch more than the allocated 25 million cubic meter per year, and may be even approach current 70 million cubic meters.

In 1952, the United Nations Relief and Works Agency for Palestine (UNRWA) requested that the Tennessee valley Authority, through the United States Development of state, prepare a regional plan for the development of the Jordan Valley. The Tennessee Valley Authority hired the Boston firm of Charles T. Main to prepare a desk study and to synthesize the essential features of the unilateral plans previously proposed for the Jordan system. The result was the so-called "Unified plan" to develop the Jordan Valley (UNRWA, 1953: 1-2).

The Israelis and Prime Minister Moshe Sharett in Particular, feet that the advantage to be gained by agreement on unified development of the Jordan would justify considerable sacrifices. Israel would be without fear of further Arab obstructionism. More important, resettlement of the Arab refugees would begin, presumably taking a great deal of heat out of Israel-Arab relations. Some Israeli a agree with Johnston that a settlement of the Jordan River problem might well be the first big step towards a more general settlement (Schmidt, 1955: 10).

When the final U.N. case-fire was imposed just 6 days later, Israeli forces had captured all the territories which had constituted Palestine under the proposed partition plan, including the West Bank and East Jerusalem from Jordan, the Gaza Strip and Sinai peninsula from Egypt, and the Golan Heights from Syria. All these lands were strategic for their natural water resources. Despite numerous U.N. resolutions, including Security Council Resolution 242, which emphasized the "inadmissibility of acquisition of territory by war (Security Council Resolution, 1967: 2).

The Jordan River basin changed importance after the 1967, so did the interest of the parties when considering cooperation. As earlier, Israel is no longer interested in basin-wide accord, largely because such an agreement would impinge upon advantages it reaps as a result of its superior riparian position on the main trunk of the Jordan River, its sovereignty over Lake Tiberias- the natural reservoir within the river system and its control over the West Bank groundwater reserves (Lowi, 1995: 134-135).

(F). WATER IN THE MADRID PEACE PROCESS

The Madrid peace process started in 1991, for the first time recognized the water question and discussed the water issue in detail. The conference adopted bilateral and multilateral tracks to find ways for wider regional cooperation between Israel and its Arab neighbours. The conference established five working groups to discuss the various issues existed between Arab and Israel. Of these groups, Water Resources Working Groups is one (Wolf, 1995b: 12-20). This group has examined ways in which more water could be provided including its efficient use and management of surface water. The group deliberately left the question of water rights to the respective bilateral talks. The group has an achieved and unprecedented degree of cooperation among participating countries for the region and beyond. Valuable work has been done on a number of important maters, such as the development and conservation of water supplies, the reuse of water and sharing of data. The bilateral talks have reached different stages as for as water is concerned. Jordan and Israel have signed a full fledge peace treaty that contains a detail arrangement of shared sources of water. The Israeli Palestinian Interim Agreement singed on 28 September

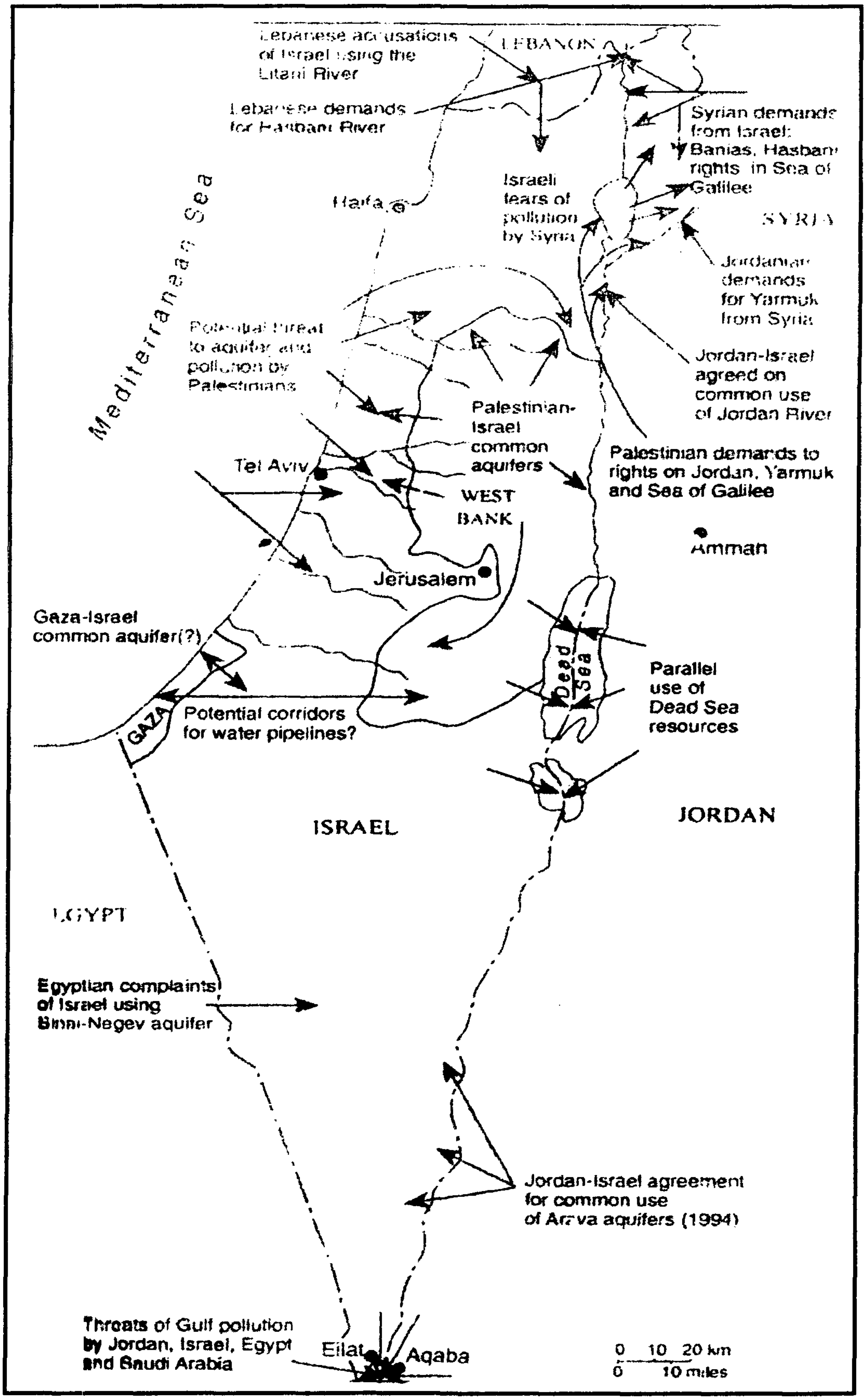
1995 postpones the question of Palestinian water rights to the final status negotiations (Soffar, 1999: 172-178).

3.12: THE ISRAEL-JORDAN WATER PEACE TREATY, 26 OCTOBER 1994

The peace Treaty between Israel and Jordan signed on October 26, 1994, aims at a "comprehensive and lasting settlement of all the water problems" between the two countries through mutual recognition of their rightful allocations" in the Jordan River, the Yarmuk River and groundwater in Wadi Araba, and cooperation in the development of existing the additional Water Resources. Details are stipulated in Annex II. In principle, the agreement maintains existing uses, with some qualifications with regard to Israel's extractions from the Yarmuk River (Edig, 2001: 145). In additional, the annex outlines a number of joint projects for the mobilization of additional waters of which Jordan shall be the main beneficiary. This includes are storage of 20 million cubic meters per year of Yarmuk water in Lake Tiberias in the winter for the Jordanian use in the summer; the transfer of or million cubic meters per year of desalinated water from Israel to Jordan; the extension of the diversion from the Yarmuk to the King Abdullah Canal; additional dams on the lower Jordan River system and other agreed locations; as well as Israel's provision of 50 million cubic meters per year of water of drinking water quality from yet to be identified sources. In addition, the agreement allows for additional Israeli pumping of up to 10 million cubic meters per year of ground water in Wadi Araba, subject to respective studies. The details of the implementation are to be determined by a Joint Water Committee (JWC).

The agreement does not specify the exact amounts of waters that shall be supplied to Jordan. Jordanian government officials have argued that a total of 215 million cubic meters per year could be provided in the context of the treaty (GTZ, 1997: 2-8). The agreement also remains incomplete with regard to the technical and financial details of the various projects, such as

GEOPOLITICAL CIRCLES IN THE JORDAN RIVER BASIN



Source : Soffer, 1999 : 180

location, implementation schedules, and funding modalities (Edig, 2001: 143). It also lacks provisions on drought management, so important in this region, as well as for conflict resolution (Allan, 2001: 219). At a more fundamental level, it does not contain provisions for the inclusion of other co-riparian (Haddadin, 2000: 279).

Implementation proved to be slow and difficult. Still, over time, a number of the provisions of the agreement were implemented. The Joint Water Committee was set up in 1994 and started to meet regularly. In July 1995, Jordan started to store winter flows in Lake Tiberian 20 million cubic meters per year. In May 1997, Israel agreed to provide additional 25-30 million cubic meters per year, apparently as part of the 50 million cubic meters per year. To be identified water (Haddadin, 2000: 287). In December 1999, the new diversion dam at Adassiya became operational (Haddadin 2000: 282). Five years after signing of the treaty, Jordan received estimated additional 50-80 million cubic meters per year of water, less than 60 percent of its total water consumption, and not more than a third of the water it had originally hoped for, but something. Serious controversies surrounded financial issues, such as the O and M costs for the water transfer from Lake Tiberias or the financial of the desalination plants from which Jordan was to receive 10 million cubic meters per year of water (Kliot & Shumueli, 1998: 221).

The Jordanian kingdom reached a peace agreement when it was thirsty for water, especially drinking water in the large cities. A future concern for the Jordanians arises on account of the use of Yarmuk water by the Syrians in the Upper Yarmuk basin and the use of Jordan water by Israel. Even in the absence of drought this combination of circumstances is liable to desiccate the Jordanian kingdom. At present Jordan is trying to overcome the water shortage by pumping fossil groundwater in the eastern desert, an operation that cannot continue for long. In the summer of 1994 in the discussions between Israel and Jordan, Israel took into consideration the gravity of the kingdom's situation and decided to transfer drinking water to Amman for humanitarian reasons (Gur, 1992: 1-2).

From Jordanian perspective, the changes in the political scene in Israel, which brought Likud to power in 1996, affected its water relations with Israel (Mahadin,9 March 2002). The meeting became intermittent and less productive, although some studies were implemented on technical matters. However, the working relation between Israel and Jordan still functioned reasonably well (Alem, 10 March, 2002). Having noted the problematic aspects of the implementation process, it is also important to discuss the positive aspects. For example, the canal for storage of Yarmuk water from Jordan in Lake Tiberias was built quickly and was inaugurated by King Hussein at the beginning of July 1995. Apart from the problems of 1999 when Israel did not want to supply Jordan with what was stipulated, there has been no problem in the transfer of water from Israel to Jordan (Allan, 2002: 176; Mahadin, 2002: 9-10)

(G). CONCLUSION

Historically, the Jordan River system has witnessed more severe international conflict over water than any other river system in the West Asia. While one can expect gradually increasing tension over the Euphrates and perhaps even the Nile, by far the most likely flashpoint for water conflict in the West Asia, today and in the near future, remains the Jordan. The fundamental reasons for this are two. There has been no significant reduction in the extremely high level of general international tension and hostility in the area- if any thing, probably the contrary. The water situation has progressively deteriorated as both Israel and Jordan are moving into full use and then into shortage conditions Slack in the system has almost disappeared, with the result that conflicts over water resources become increasingly zero-sum and exacerbated.

History and experience in this water-scarce basin demonstrate that sustainable solutions to water problems, whether domestic or international, always require cooperation, equitable sharing, and efficient utilization among involved parties.

However, the complex environmental and hydrological issues cannot be resolved by political formulas negotiated by diplomats alone. The tasks of environmental rehabilitation and particularly of water resource development and efficient utilization require a considerable investment of capita.

The case of the river Jordan is unique in words hydropolitis and geopolitics owing to the combination of a small quantity of water and a large number of partners among whom there exists a prolonged and very serious conflict. Failure to find a solution to this problem could be a cause of internal stability or under mind international agreements that have been achieved by the countries of the area. Hence there is an urgent need to enhance water supply in the region. There are many ways of increasing a countries water supply, a part from building more dams digging more wells or bring waters from other river basins. The increasing environmental aver ness in the region has highlighted the fact that since were can not change the ecological givens, it could not increase the water supply in real terms and in the long runs the cost of war would far exceed the possible return. Further more the historical background of water management policies in the region indicates that the indigenous inhabitant of the West Asia have always been aware that cooperation between riparian parties over there shared water resources is the only way to create a win situation in which all parties are better off. The scarcity of water there fore thought it might cause periodic tensions does not encourage states of the region to employ violence to resolve the problem. Indeed there is considerable evidence indicating that hydrilopolitic in West Asia is a contest for cooperation in which the development of common water resources will create a network of collective interest and a platform for a common perceptions that will finally breed more regional instigations and peace full coexistence.

Chapter-IV

The Euphrates-Tigris Rivers Basin

(A). INTRODUCTION

The next flash-point where water wars are claimed to be most likely is the Euphrates-Tigris basin. Being one of the vital water resources, in West Asia, Euphrates-Tigris constitutes a single transboundary water course system. The Euphrates-Tigris have entirely separate drainage basin, but because their last sector is united it is usual to discuss the two rivers as a single system. Historically the Euphrates-Tigris basin has been one of the centres of the oldest civilizations of the world. The civilization of this basin is generally known as Mesopotamian civilization (land between the two rivers). Several ancient civilizations in Mesopotamia were supported by irrigation from the Euphrates-Tigris basin. Thousands of year ago, water from these two great rivers helped to create the" fertile crescent" giving rise to the first civilization of West Asia. Throughout history water has been used to establish hegemony by the successive rulers in the course of waging strategic warfare against the rival power or enemy. Over the course of human history different factors have come together many times to produce a wide range of disputes over access to shared fresh water resources in Mesopotamia (Peter, 1998: 125-128).

In Mesopotamia (Iraq) were those of the Sumerians, Akkadians, Babylonians and Assyrians. They organized an efficient hydraulic civilization which, at its peak supported some 20 million (Cressey, 1960: 108-122). They were based on wise use of the river water, including control of the flood water and efficient irrigation practices. The control and appropriation of water resources has been the prevalent feature of water management policy in the basin from olden times--a feature which characterised then as hydraulic civilisation. These civilisations had the engineering skills necessary for an efficient water-management system; they had also the social and legal institutions required for maintaining the functionality of such a system. Hence, although water has sometimes been used as a defensive barrier or a destructive weapon, water imperative conflicts have never occurred in this region (Ionides, 1937: 147).

The Euphrates is an international river that flows in Turkey, Syria and Iraq. The Tigris is an international river flowing though Turkey, Iran and Iraq and forming the border between Syria and Turkey and between Syria and Iraq for a short distance. The Euphrates-Tigris have almost completely separate basins which unity only in their last 190 km at the Shatt al-Arab; but as Iraq, Syria and Turkey share both rivers, it is customary to treat the two separate basins as one unit (Ionides, 1937: 18-115).

Of the three riparian in the Euphrates-Tigris River Basin-Turkey, Syria and Iraq-Turkey is in the most advantageous position. It has several relatively abundant rivers and enjoys the greatest waters endowment relative to demand. It is economically and militarily the most powerful state in the basin region and enjoys the status of being the upstream state. Both downstream states have extensive desert and semi-desert composing about one half the land area of Syria and two third of Iraq. The Euphrates accounts for the major source of surface water to Syria, the midstream riparian. As for Iraq, the furthest downstream, agriculture in all but the northern portion of the country is heavily dependent on water from both the Euphrates- Tigris River (Lowi, 1955: 56-61).

The water question emerged on the regional agenda when the three riparian initiated major development projects. It is only since the 1960s that Turkey and Syria have launched ambitions plans to develop the waters of the Euphrates-Tigris river system for energy and irrigation purposes. At the same time, Iraq too announced new schemes for an extension of its irrigated area. The uncoordinated nature of these supply by developments as well as inefficient and ineffective demand management parities with in the framework of national water policy and management by the co-riparian continue to be the principal causes of water imbalance in the Euphrates-Tigris River Basin (Tekeli, 1990: 208).

The GAP or Southeast Anatolia Development Project is a massive water management scheme that involves dam building, diversion, and the extension of irrigated agriculture in the south eastern region of Turkey. Today, work on the project is well under way, and the planned withdrawal of 14 to 17 billion cubic meters of the total 32 billion cubic meters, promises much hardship downstream. Syria's ability to generate hydropower will be curtailed by the depleted water levels. Its ability to extend irrigation agriculture will be hampered by both the depleted water levels and the inferior quality of water that is introduced into the system (NewSport 19 July, 1988: 5). Iraq will have to forfeit part of its intake from the Euphrates and settle for water of inferior quality as well. The country will no longer have the large volumes of fresh water with which to reclaim its already highly saline soil. Indeed, the key environmental effect of the GAP project is not so the reduced flow-a distributional issue--as most of the water will be introduced into the system but rather the inferior quality of that flow. Because much of the water released downstream will have already been used for irrigation, it will have a relatively high content salts and contaminants that will render it unusable for the growth of certain crops and will degrade the quality of soils along the river banks and surrounding areas (Lowi, 1995: 75-80).

This chapter is largely devoted to discussions of the origins and the evolution of water disputes in the Euphrates-Tigris basin. The chapter incorporates recent developments and prospects for cooperation in the Euphrates-Tigris river basin. It will analyse the limitations and shortcomings of existing water allocation mechanism. The chapter will also examined merits of the principle of equitable utilization and the "needs-based approach" regarding the water sharing.

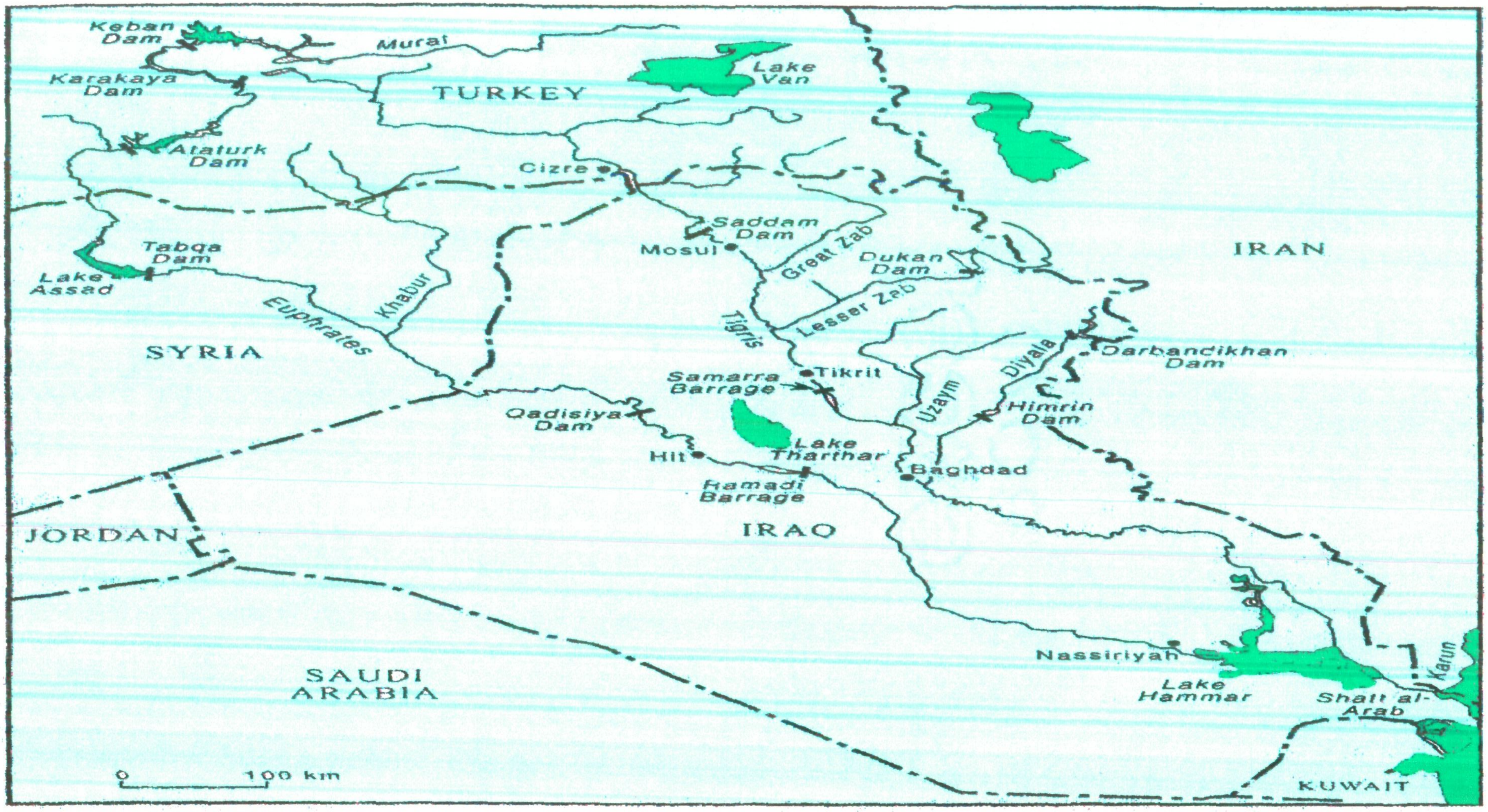
(B). *HYDROLOGICAL FEATURES OF THE EUPHRATES -TIGRIS RIVERS BASIN*

The Euphrates-Tigris basins drains an area of around 90,0000 square kilometres. From its headwaters to the sea, the Euphrates traverses a distance of 2700 kilometre, covering an area of 444000 square kilometre which includes surface tributaries, Wadis, and areas of purely subsurface recharge. Its twin, the Tigris, has a total length of 1900 kilometre and embraces an overall area of 470,000 square kilometres though its effective catchments area is estimated to be between 217843 and 373000 square kilometre (Grolier, 1993; Hillel, 1994: 92).

The Euphrates-Tigris, rise in the mountains of eastern Turkey, the Euphrates flows through Syria to Iraq before emptying into the Gulf. The Tigris flows to Iraq and joins with Euphrates in Iraq before reaching the Gulf to Shatt al-Arab. Until the end of the World War I these river were under the control of Ottoman Empire, and little international importance was attached to the river basin.

The Euphrates consists of two tributaries, the Karasu and Murat Rivers both originating in Armenian mountains of eastern turkey. The Karasu, which rises close to the city of Erzurum, and the Murat, rising close to Mt. Ararat. The river flows through the Anti-Taurus Mountains before exciting into the Jezra plain in Syria (Soffer, 1999: 75). In this stretch the Euphrates is joined by two major tributaries, the Balikh and the Khabur near the town of Raqqah and Dayraz Zawr. From there to the Gulf no water is added to the river. The Euphrates and its tributaries drain an enormous area in, of which 28 percent lies in Turkey, 17 percent in Syria, 40 percent in Iraq and 15 percent in Saudi Arabia. Approximately 88 percent of the mean annual flow is generated within Turkey and almost all of the reaming 12 percent within Syria (Hillel, 1994: 92). Table indicates the three riparian countries contribution and demands respectively. Except in years of exceptional rainfall, Iraq's contribution to the water of the Euphrates is

THE EUPHRATES- TIGRIS RIVERS BASIN



Source : Shapland, 1997 : 90

virtually nil. The Euphrates is joined by the Tigris just above Basro near the town of Qurna only 100 kilometre from the head of the Gulf to form the Shatt al-Arab water way. In Iraq, the Euphrates `receives no further discharge from any source (Hardan, 1993: 76).

The Euphrates drains an enormous basin. Besides its two wings in Turkey, the Karasu 21,500 square kilometer and the Murat Suyu 39,700 square kilometer, whose confluence at Keban forms the Euphrates, it drains an area of 96,000 square kilometer between Keban and Jarablus, the place were it enters Syria. From Jarablus to Anah, where it enters Iraq, it drains 229,000 square kilometer, and from Anah to the point where it enters the Gulf, it drains 444,000 square kilometer. The area from which the Euphrates is fed is confined to the mountains in the north, which consist of 82,330 square kilometer only, i.e. some 20 percent of the total area of the basin. 80 percent of the area is made up of steppe and desert (Al-Furat, 1965, Vol.2: 947).

The mountainous Mediterranean climate zone-climate determines the flow regime of the River. Temperatures in the mountains frequently fall bellow 0^0C during the winter and the Euphrates is largely fed by precipitation falling over the uplands of Eastern Turkey, where the annual total precipitation often exceeds 1,000 mm. As most of this precipitation occurs during the winter months as snow, it tends to be locked up as snow and ice, but with rising temperatures in spring and early summer, the snow fields melt. The rainy season starts in October and ends in April (Beaumont, 1978: 35).

The Tigris River also rises in the mountains of southeast Turkey from Lake Hazer. It forms the border between Turkey and Syria for distance of 40 kilometres and border between Turkey and Iraq 7 kilometres, as it flows directly into Iraq. The Tigris flow parallel to the Zagros Mountains and collects many tributaries on the way, which drop down into it perpendicularly from the hills. In Iraq Tigris river joined by few tributaries viz Botan, Batmansu, Karpansu and the Greater Zab rivers emerging from turkey, the lesser Zab, the Adhaim and the Diyala, which originate in Iran, and finally Uzayam whose source is in Iraq's northern mountains. Close to where the Shatt al-Arab empties into the Sea it is joined by its largest tributary, the Karun emerging from Iran. The Tigris receives virtually 50 percent of the water in Iraq the tributaries, which join the Tigris in Iraq add a significant amount of water to the Tigris below Baghdad. As a result, Iraqis supply of water from the Tigris is much less vulnerable to developments upstream than is its supply from the Euphrates. Iraq also has an opportunity to obtain water from Tigris. Iraq has the Physical means to do so, having constructed canals linking the two rivers. However like the Euphrates the volume of the Tigris also varies greatly from year to year and season to season. This may limit Iraq's opportunities for substituting waters from the Tigris for that of the Euphrates, or vice-versa, when the flow in one river is low (Dolatyar & Gray 1999: 119-122). The following table explains the water potential of the Tigris basin and consumptions targets of the riparian countries. The Tigris drains an area of 470,000 square kilometres, of which 12 percent lies in turkey, 0.2 percent in Syria, 54 percent in Iraq, and the rest in Iran (Hillel, 1994: 92).

Rainfall in the plain is characterized by a low average precipitation, of 150-200 mm per annum which occurs mainly in the November- April winter season. The rainfall is not reliable in any part of the plains, and the records show large fluctuations from year to year. Summer in this region is intensely hot, with day shade temperatures frequently reaching a maximum of 45^0C in July and August and from 30^0C to 35^0C in the Al-Jazira sub region. Throughout the entire basin, the winter season (December, January and February) is the most humid, with over half of the annual precipitation in the valley falling during these months, while the summer season is very dry and brings little precipitation. The average annual temperature in Turkey is 17^0C, in Syria 20^0C, and in Iraq 23^0C (McLachlan, 1976: 41).

REGULATION OF THE EUPHRATES-TIGRIS RIVERS

Source: http://maps.grida.no/go/graphic/regulation_of_the_tigris_and_euphrates_rivers

Turkey is the richest country in West Asia in terms of both ground and surface water resources. According to data obtained from Turkish sources average annual precipitation in Turkey is 50 billion cubic meters but owing to excessive in filtration, transpiration and evaporation, only 186.05 billion cubic meter ends up as surface runoff. Considering percent technological, topographical, and geological constraints, an estimated 95 billion cubic meter per year of Turkey's surface water runoff plus an additional 11.6 billion cubic meter of ground water can be used. So far, how ever only 40 billion cubic meters of these resources have been annually appropriated by turkey (Tomanbay, 1993: 53).

Table No-4.1

Annual surface water and withdrawal in the Euphrates-Tigris basin

Annual river flow				Annual withdrawal		
	Interna flow (bcm)	**In flow (bcm)**	**Out flow (bcm)**	**Total (bcm)**	**Per capita (cm)**	**% of total water resources**
Turkey	196	7	69	15.6	317	8
Syria	7.6	27.9	30	3.34	449	9
Iraq	34	66	n.a.	42.8	4575	43

Sources: World Resources Institute, 1990: 33

In contrast to Turkey's relative water abundance, more that half of Syrian and almost two-third of Iraqi territories is desert, with less than 250 mm of rainfall per year, which is the minimum amount needed for rainfed agriculture. Although Syria has other water resources, the Euphrates is the only major river crossing its territory with reliable annual flow. Accordingly, Syria depends heavily on the Euphrates, whose waters account for as much as 86 percent of the water available to the country (Lowi, 1995: 45).

In the case of Iraq, except for its mountainous north, which enjoys a milder climate and considerable rainfall, the climate is characterized by hot summers and cool winter. In the Mesopotamian plain itself, that annual rainfall is meagre and the summer norths are exceedingly hot and dry median temperatures approach 50 degree Celsius. Consequently the evaporative rate is very high, and agricultural production is totally reliant upon irrigation (Hillel, 1994: 97; Lowi, 1995). Although Iraq, like Syria, is heavily reliant upon the Euphrates water, it is fortunate in having an alternate's source of water in the Tigris River, whose headwaters are slightly tapped (Starr, 1991: 30; Gleick, 1994: 12).

The Tigris discharge is greater than that of the Euphrates. The headwaters of both the Euphrates-Tigris generate a water supply of around 40 billion cubic meters annually. Both the rivers provide Iraq with around 50 billion cubic meter annually be fore uniting into the Shatt al Arab at Qurna, with the Euphrates providing 57.5 percent of the flow and the Tigris with 42.5 percent. The average annual discharge of the Tigris near Baghdad is 39.5 billion cubic meter (1240 million cubic meters per second), while the average annual discharge of the Euphrates near 26 billion cubic meter (710 million cubic meter per second).

The total discharge of the Euphrates is currently between 30 and 32 billion cubic meter (Bakour & Kolar, 1994: 128-129), but it changes from year to year. The Tigris also varies is its discharge from year to year. The average annual figure at Akut is 31 billion cubic meter. It is difficult to determine the average annual discharge of the two rivers together because of the large annual variation. However, the average is about 74-81 billion cubic meters (Beaument, 1988: 364). Such variation makes it difficult to determine a fair division of the rivers water among these riparian. Another difficulty in such a decision is that in the Tigris and Euphrates basins, unlike basin, the discharge of water has not been satisfactorily measured and the behaviours of the rivers and their tributaries is not yet entirely clear. The many dawns on the two rivers make it difficult to calculate the amount of water available in each state (Ionides, 1973: 147).

Table No-4.2

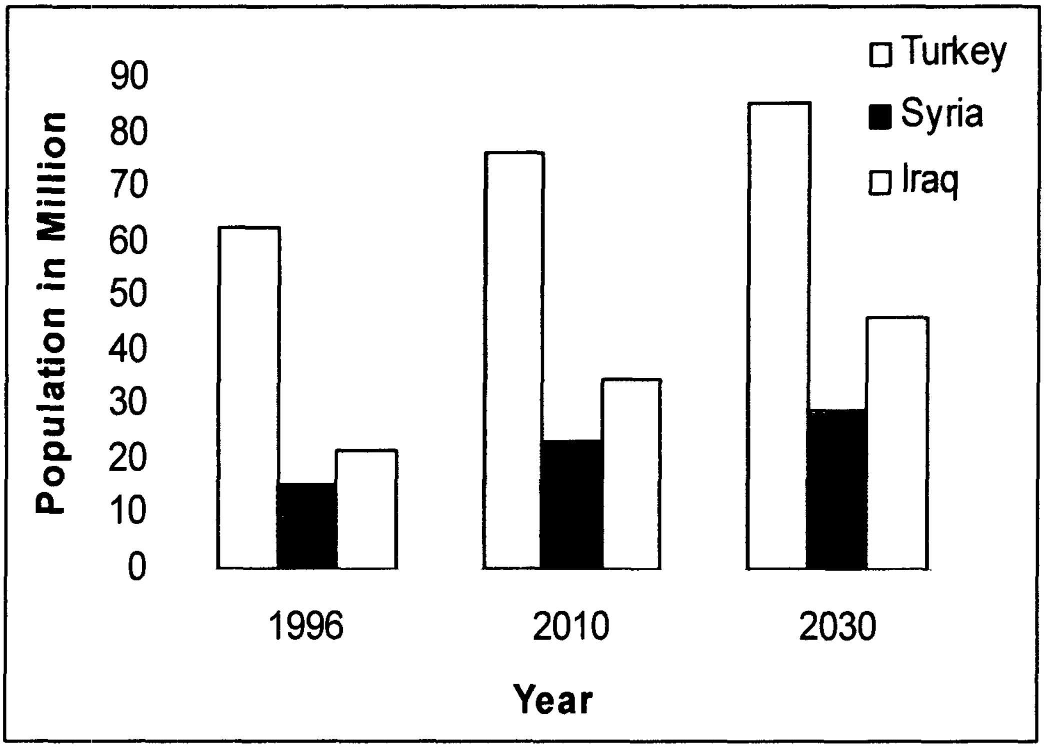
Population in millions: 1996, 2010, 2030 estimates

Country	1996	2010	2030
Turkey	62.48	76.57	85.56
Syria	15.61	23.33	28.93
Iraq	21.42	34.55	46.26

Sources: The World Almanac and Book of fact, 1997, Mahrab, New Jersey: World Almanc book, pp. 838-839.

Future Population pressure in the Basin States

Graph 4.4: Population in millions: 1996, 2010, 2030 estimates



Population growth is one of the primary factors putting the utmost pressure upon the availability of water for the co-riparian states. The largest population increase in the West Asian countries has been observed since 1985 (UNDP, 2002:38). According to various estimates, the region's total population may reach 390 million in 2010, and 475 million in 2030 (World Bank, 2000: 38-44; Laipson, 2002: 177).

The total population of the Euphrates-Tigris basin countries is around 115 million, 19 million of which live in Syria, almost 26 million in Iraq and more than 70 million in Turkey (UNESCO, 2006: 133-135; Turkish Statistical Institute, 2008: 2). The rates of population growth are 2.3%, 2.9% and 2.2% in Syria, Iraq and Turkey respectively while the world average is around 1.3%. The population growth in the riparian countries increases the pressure on the carrying capacity. Therefore, access to sufficient water by those countries becomes more important each day as the agricultural areas open to irrigation need to be enlarged to nourish the increasing number of people. When coupled with other political and socio-economic problems, the downstream states seek two ways to externalize these problems to the upstream states, leading to deterioration of the hydropolitical relations among them (Libiszewski, 1999: 27).

(C). DISPUTES AND AGREEMENTS OVER THE EUPHRATES - TIGRIS RIVERS BASIN

4.1: EMERGING CONFLICTS OVER THE EUPHRATES–TIGRIS RIVERS

The waters of the Euphrates-Tigers have been diverted by human action to irrigate agriculture land since ancient time. Centrally controlled irrigation was practice for the time of the Sumerian civilization over 4000 years ago. However the system falls increasingly into disrepair during the later years of the Abbasid Caliphate, partly because of the declining effectiveness of the government and partially because of physical causes such as the silting up of the major canals. One of the wonders of Mesopotamian Civilizations is the Naharwan Canal, built in the six century BC. The Nanamrod Dam built on the Tigris blocked the natural flow of the river and diverted the water into the canal (Ionides, 1973: 147). During the same period regulatory and divergence dams were built on the Diyala and the Adhaim.

The Mangol invasion of 12, 58 virtually destroyed the irrigation system in Mesopotamia. Rival effect to rehabilitate irrigation system in the Mesopotamia plans began only in the 20th century, with the construction of the Hindia Dam on the Euphrates in 1911-1914. After that Dam was also built on the Tigris to produce Hydropower and barrage constructed on the Euphrates at Ramadi to protect area further down stream from flooding (Shapland, 1997: 107).

One of the most conspicuous structures of this civilization was the Nahrawan Canal built during the sixth century AD. The Canal, which was 300 km in length and more than 30 m wide, drew water from the River Tigris near Samarra and transported it southeast to the lower plains of the River Diyalah where it was used for irrigation purposes. It was the ancient 10 m high Nimrod Dam that moved waters to the Nahrawan Canal by closing off the old course of the Tigris and diverting the waters to it (Ionides, 1937: 147); but there were also ancient barrages on the Adhaim and Diyalah.

The period of Ancient Mesopotamia was the last time that some from of integrated planning took place in the Tigris-Euphrates basin for the basin as a whole. Yet this did not constitute a problem, as the demand for Tigris-Euphrates water was only local and did not create any difficulties for the various users. Although the Habbaniya and Abu-Dibbis Lakes were used for flood control purposes in Iraq for thousands of years, modern engineering work in Iraq only began with the construction of the Hindiya Barrage on the Euphrates during the years 1911-14 when embankments and levees were constructed on both sides of the river channels to prevent flooding. This system allows water to be transferred to secondary feeders and carried to the fields all year round. Table-4.3 presents the patterns of utilization of waters in the Euphrates-Tigris system. The table presents simple water projects whose sole purpose is flood control and water diversion to the irrigation canals. It is not surprising that all the barrages, regulators and lakes in Table 4.3 are located in Iraq. Iraq was the first country in the basin to begin utilizing the Tigris-Euphrates waters in modern times because of its traditional use, especially of the ancient Habbaiya and Abu-Dibbis Lake for thousand of years. The Iraqi system of water management reflects a combination of 'old and new' and the real and urgent need to prevent floods. It is also interesting to note that Iraq has accumulated a significant storage capacity in Habbaniya and Abu-Dibbis-a total of 46.0 billion cubic meters. Not all of it is available for irrigation, but some of it is, and Iraq uses this water extensively when there is not enough water in the Euphrates (Ionides, 1937: 18-115).

In Turkey about 20 more dams are under construction or in planning on both rivers. In Syria 10 more dams are under construction on the Euphrates and tributaries. In Iraq 9 more dams are under construction or in planning on both rivers.

In 1984 the Iraqi Government was able to release water stored in the Lake Habbaniya reservoir to local farmers to offset the low level of the Euphrates (Hindley, 1989: 5). The same is true for the depression of Tharthar which has become Lake Tharthar with a storage capacity of 30.0 billion cubic meters. More than $300 million has been invested in the lake Tharthar project in order to turn this natural depression into an artificial is to alleviate water shortages within the Euphrates basin, to control flooding and to drain salts from the irrigated areas between the two rivers. But perhaps the greatest significance of the Tharthar link is that it connects the Euphrates- Tigris and makes them one river system (Ionides, 1937: 18-115).

The Tharthar Lake and Samara Barrage have succeeded in preventing floods in Baghdad since 1958, but most of the aforementioned water control projects have played a major role in providing irrigation water to a complex network of canals in central and lower Iraq, in areas already cultivated for thousands of years. Table 4.3 shows that most of the above single-purpose water control projects were completed by the 1950s and thus established Iraq's prior rights to the Euphrates-Tigris waters. The present system of barrages, regulators and Lakes reflects the continuity of the hydraulic Mesopotamian civilization and, more specifically, the continuity of the hydraulic Mesopotamian civilization and, more specifically, the continuity of Iraq's utilization of the Euphrates-Tigris waters of irrigation. A more modern project included in Table 4.3 is the Main Outfall Drain, which is a 500km long drain whose task is to drain some 2 million ha of irrigation water and which empties into the Shatt al-Basrah (Peter, 1998: 121-125).

The use of Euphrates-Tigris water in Iraqi territory from the start of the civilization the flourished there until today give Iraq historic rights over the water. In 1958, a canal was constructed to direct excess water from the Tigris to the Tharthar depression and prevents flooding in the low line area of Baghdad. Presently Iraq has many dams and lakes to store the water of the Euphrates-Tigris.

From 1950 onward many water projects were founded on the Tigris and Euphrates. However there are no cooperation among the states and the project of the upstream states have upset the plans of the downstream states, which have been obliged to adjust accordingly. In fact some of the projects initiated by the down stream states in the mid 1980s were undertaken to solve problems of over use of the river water in its upper sections. A vicious circle was there by crated in which the damage caused was greater than advantages gained (Aranon, 1999: 84).

Table-4.3
Water projects in the Euphrates-Tigris Basin (Technical Data)

Project	River and Country	Years of construction	Storage Capacity (billion cubic meter)	Sizes of Dam	Purposes
Barrages in Iraq Habbaniya Lake	Iraq	Natural depression	32	C 166	Flood control, irrigation in the dry season
Abu Dibis lake and barrage	E, Iraq	Natural depression Barrage built in the 1950s	14.4	A 46 B 1968 C 70	Flood control, irrigation in the dry season, connected to Habbaniya Lake
Hindiya barrage	E, Iraq	1911-1914	None	A 25 B 817	ft Raising water to feed the Hilla, Musaib, Elhosaniya, and Beni Hassen canal
Diyala barrage	Diyala Iraq	1927-1928	None	A 40 B 1400	Diversion of water to irrigation canal
Kut barrage	T, Iraq	1934-1943	None	A 34 B 227,0	Diversion of water to shatt el jaref
Lake Tharthar	T, Iraq	1950s	30	A 23 B 1650 C 1042	To prevent floods in Tigris transfer from Tigris to Euphrates (second stage)
Ramadi barrage	E, Iraq	1954	None	A 33 B 685	Flood control and direct water to habbaniya Lake
Samara barrage	T, Iraq	1958	None	A 33 B 826	Diversion of water to lake Tharthar
Falluja barrage	E, Iraq	1985	None	---	Diversion of water to irrigation canals
Dams Dokan Dam	Little Zab, Iraq	1959	0.63-0.75	--	400MW hydropower, water storage, and irrigation
Darbandikhan Dam	Diyala Iraq	1961	5	A 393 B 429	Hydropower, flood control, and storage
Kaban Dam	E, Turkey	1965-1935	30	A 6923 B 3598 C 262	120 MW hydropower

Tabqa Dam	E, Syria	1965-1973	12	A 197 B15088 C 247	800 MW hydropower, irrigation
Karakaya Dam	E, turkey	1976-1988	9.6	A 482 C116	1800 MW hydropower
Haditha (Kadisiya) Dam	E, Iraq	1979-1990s	17	---	600 MW hydropower, storages, and irrigation
Eski Mosul (Saddam)Dam	T, Iraq	1983	30	A 154 B11808	750MW hydropower, storage, and irrigation
Al-Ba'ath Dam	E, Syria	1983-1986	0.9	A 49 B 2460	81 MW hydropower, storage, and irrigation, improvement of fishing
Ataturk Dam	E, Turkey	1983-1990	49	A 577 C 2680	2400MW storage, and irrigation
Batama Dam	Little Zab Iraq	1989		A 689	Hydropower and storage
Tishrin Dam	E, Syria	Under construction	1.3	A 164 B3280	630 MW hydropower and control
New Canals "Third" River	E, T, Iraq	1992			Drain marshes, irrigation, drainage
"Fourth" River	E, Iraq	1992			Drain marshes, irrigation, drainage

Sources: Ionides, 1937; Cressey, 1960; Beaumount, 1978; Naff and Matson, 1984; Ockerman and Samano, 1985; Saleh, 1985; Kolars, 1986; Beaumont et al., 1988; Kolars, 1994; Middle East and North Africa, 1996; North, 1993.
E-Euphrates
T-Tigris
A=height (ft) B eq length (ft); C= size of Lake (square mile).

Since the early 1960s there were attempts to faster dialogue and information exchange in the region through a series of technical water negotiations. One could observe that the riparian had adhered to stringent position, which hardly changes during the course of the negotiations in three decades time until the suspension of the negotiation in the early 1990s. Thus Iraq showed great anxiety toward the progress of the water development projects in Turkey in Syria. Iraq, later, joint by Syria in the early 1990s kept insisting on concluding immediate water sharing agreements. Turkey as the new user had presented the exigency of its planned major an offered a joint study to find out the irrigations needs of the riparian before any basin wide allocation agreed in the river basin (Kibaroglu, 2000: 311-315).

The three riparian entered the new face of there relationship over water upon the decision by Turkey to construct that Keban Dam of the Euphrates. The down stream riparian, particularly Iraq, insisted on guaranteed flows to be released by Turkey during the impounding of the Dam. The real problem emerged when the midstream and upstream country, Syria and Turkey respectively initiated projects for the developing the waters of the Euphrates in the 1960s (Helal, 1994: 3).

Hence a first meeting was held in June 1964 with the participation of Turkish and Iraqi experts. The meeting started with dissent, but letter and the end of the negotiation Turkey agreed to all necessary steps to maintain a discharge of 350 cubic meters per second immediately downstream from the dam, provided that the natural flow of the river was adequate to supply the above discharge. During the meeting a Joint Technical Committee was proposed the established but due to disagreement among the riparian committee could not be found. In 1968 Syria started to build Tabqa Dam of the Euphrates with the Soviet assistance. Iraq, too had under taken the Gharraf Project between the lower reaches of the Euphrates-Tigris Rivers Tabqa and Keban Dam were completed in between 1973-75. The operation of both the Dams created crisis in the regions. Iraq accused Syria of reducing the rivers flow to intolerable levels, while Syria transferred blame to Turkey. The water brought Iraq and Syria to the brink of armed conflict (Naff & Matson, 1984: 42). In 1974 Iraq threatened to bomb the Keban Dam in Syria and massed troops along the Syrian border, alleging that dam had reduce the flow of water to Iraq. However a water war was averted through the frantic efforts of Saudi Arabia and Soviet Union. An agreement was singed between Iraq and Syria. According to the agreement Syria will keep 40 percent of water and will allow 60 percent to pass through to Iraq (Bilen, 1994: 75).

It should be noted that there are two distinct phases in the growth of water resources management in the basin. In the first phases from the collapse of the Ottoman Empire 1918 to the 1960s, flood control was the main concern to riparian party particularly of Iraq. In the second phase from the 1960s until now, all riparian countries, especially Turkey, with the help of modern technology embarked on massive water development schemes including hydropower generation. It is in this second phase that the question of water is becoming a more explosive issue then that of oil. During the first phase there were no signs of water conflict noticed rather cooperative majors (Kliot, 1994: 136).

The water resources began to change in the when, 1960s, both Turkey and Syria started to draw up plans from large scale exploitation of the Euphrates and to a lesser extend the Tigris. Iraq the major user of water in the basin perceived it as a emergence strategic challenge that both Syria and Turkey worked determined to raise there claim on there shares. A series of trilateral bilateral diplomatic discussion were held without reaching on any formal agreement. The failure of the party during these negotiations to reach a formal and comprehensive water allocations agreement impelled each countries to embark on its own development plans on the portion of the rivers in its territory (Gleick, 1994: 13).

In the 1970s Turkey embarked on the rapid development of the east, with the south east Anatolia Project. Turkish government has many reasons for undertaking this projects which will use large quantities of water from the Euphrates-Tigris water. In the beginning of the 1970s Turkey dependent heavily on imported oil for energy. The oil price shocked of that decades added greatly import bill and course the government to place even greater phases on hydropower. The South East Anatolia Projects known as GAP was to increased hydroelectric production and to irrigate an additional two million hector of land. The projects areas include the watersheds of the lower Euphrates-Tigris River and the upper Mesopotamian plans. The water resources development programmed of GAP includes 13 groups of irrigations and energy projects, seven on which are in the Euphrates River and six on the Tigris. The project includes 22 dams 19 hydropower plants and irrigations networks on the Euphrates-Tigris river basins. The centre peace of the GAP is the Ataturk Dam. It is a huge pace of engineering by any standard and has storage capacity of 48.7 billion cubic meters-over four times the volume of Lake Asad (map) (Shapland, 1997: 111-114).

Table no-4.4

Potential water-use along the Euphrates (million cubic meters)

Mean total discharge at Hit	31,820
Turkey	
Evaporation from reservoir above Keban Dam	476 (max.)
Evaporation from reservoir above GAP project	606 (max.)
Potential water withdrawal for irrigation	3,500-7,000
Syria	
Evaporation from reservoir above Tabqa Dam	630 (max.)
Potential water withdrawal for irrigation	5,000-10,00
Iraq	
Water use (1960-1969)	17,213
Evaporation from reservoir above Haditha Dam	602 (max.)
Total	Min= 28,028 Max= 36,538

Sources: Beaumont, 1978: 41

Unlike the Keban and Karakaya Dams, the Ataturk dam is design to store water or large scale irrigations and for production of hydroelectric-27 billion KWH with an installed capacity of 75000 MW for that reason it is regarded by Syria and Iraq as a more threatening project than its to predecessors on the Euphrates (Keban and Karakaya) (Kliot, 1994: 136).

Before the construction of the Keban Dam Turkey use only 3 percent water only and, only three percent of the Euphrates water, and the first two dams of the GAP caused only miner water loss from the river. Infect these two dams simply regulated the fluctuation of Euphrates discharge. How ever the total water withdrawal for irrigation associated with the Euphrates portion of the GAP was projected in the master plan to amount to 10.5 billion cubic meter billion. This rang alarm bells in both Syria and Iraq how relive heavily on the Euphrates river for drinking water, irrigation, industrial use, and hydroelectric, view any upstream development with concern (Kolars, 1994: 74-75).

The implantation of the GAP and exaggerated production suggesting that Turkish water extraction would exceed 17 BC per year, as created anxiety in Syria and Iraq. It was clearly to the advantage of Syria and Iraq to reach agreements with Turkey that would grantee them a fix quantity of water each year or a fix percentage of available flow. However, adopting the legal doctoring of absolute sovereignty, Turkey was reluctant to give its resentful neighbour and established easement with would affect it most important national development plan-GAP. Neither Turkey was ready to give Syria and Iraq a role in the GAP, nor were they likely to respond to Turkish call for regional coordination with any explicit agreement insuring that the management and sharing of rivers was equally in the hand of all the riparian involved (Kolars & Mitchell, 1991: 31).

The Turks claim that since there was no international regulation which governs the rights of riparian states nor any specific treaty which regulate the sharing or common exploitation of the Euphrates-Tigris, the status quo was in Turkey's favour. However Syria and Iraq insisted on there write to share the water of the rivers. There major argument was that international president, if not enforce law, warrants that the management and sharing of international rivers be equally in the hands of all the riparian countries involved (Kolars, 1994: 88). Referring to there ancient "acquired rights, because they made the prior use of the water sources, Iraq claimed 59 percent of the natural flow of the Euphrates at the Syrian Iraqi border and Syria claimed 40 percent of the flow at the Turkish Syrian border (Wakil, 1993: 64).

Turkey's response was fourfold:

- Adopting the legal doctrine of absolutes sovereignty Turkish sources argued that the Euphrates-Tigers both originate on Turkish soil and are Turkish rivers while they flow over Turkish territory, concluding that Turkey is not obliged to share its waters with it Arab neighbours

- Turkey claimed the Euphrates-Tigris Rivers as Trans Boundary Rivers were as Syria and Iraq consider them to be international.

- Third it maintained that Euphrates-Tigris Rivers must be considered together as a signal transboundary water course system.

- Turkish officials declared that Turkey would agree to shared transboundary waters if they included the river Orontes as well as the Tigris rivers in short Turkey claimed and undisputed rights to use the water within its territories without the consent the other riparian in the same way that Arab states regard oil as a natural resources which is subject only to there sovereignty. The controversial argument brought up the question of the legal status of water and the legitimacy of drawing a parallel between the legal status of oil and water. Responding to this that Turkish attitude Syria adhered to doctrine of limited territorial sovereignty and called for a fair sharing of the Euphrates-Tigris water. For its part Iraq held to the doctrine of absolute territorial integrity insisting on its ancient or prior rights of usage of water from the Euphrates-Tigris water (Chalabi & Majzoub, 1995: 208).

(D). IRRIGATION AND DEVELOPMENT PROJECTS

In the period between the two world wars no conflict existed among the three countries over the use of the Euphrates water at that time. Turkey was engaged in one boundary dispute with Iraq over the Mosul province but, despite its seriousness, after there conflicts were resolved it did not affect the water issue (Abbas, 1984: 172).

Until the mid-1960s, the only country which made large-scale use of the waters of the Euphrates was Iraq. In Syria limited irrigation was practiced alongside the river, while in Turkey the waters of the Euphrates were used even less (Beaumont, 1978: 35).

An important feature of the rivers system which had a favorable effect on agriculture is that the bed of the Euphrates, from north of Falluja south wards until the two rivers meet at Qurna, is slightly higher than that of the Tigris. In modern time, as in the past, this difference of elevation has been utilized to build a network of gravity flow canals from West to East to irrigate large area of land (Qubain, 1960: 70).

4.2: TURKEY

Under the leadership of Kemal Ataturk, Turkey became the first state in West Asia to draw up a five- year development plan and, within a few years of the announcement of this initiative, Turkey embarked upon an economic experiment that was to be emulated in several countries following Second World War (Richards & Waterbury, 1990: 188). Since 1963, when the first five year development plan was launched, the economic development policy of Turkey has centered on state enterprise initiative and imports substitution through industrialization. An agriculture and water development, however, have received relatively little attention, with the exception of power generation projects that were needed to provide energy for new industry. This emphasis on power generation has led to the development of a number of multipurpose water projects, particularly on the Euphrates River (Turkey 1958: 5).

Throughout this period of economic development agriculture has remained the main source of employment despite the rapid growth of industry averaging 11 percent per annum (Wilson, 1979: 95). Given the current average annual population growth rate of 2.2 percent and an increase in per capita demand for food of around 1.2 percent per annum, Turkey needs to maintain an annual growth rate in food production of around 3.5 percent to meet the requirements of domestic demand (Bilen & Uskay, 1991: 4-1).

The high rate of growth in total population and the even higher rates of increase in urban population, together with changing household structures and social preferences, have led to an increased demand for water with the total water supplied for drinking and utility purposes increasing almost 2.5 times throughout Turkey. In 1980 the total amount reached about 1.6 cubic kilometer per year, increased to 2.8 cubic kilometer annually by the end of 1985, and rose to 4.0 cubic kilometer by the end of 1990.

With current available water resources it would be economically feasible to irrigate an estimated 8.5 million hectares with major and minor irrigation works and a further 16.8 million hectares using advanced technology. At present both groundwater and surface flow are used to irrigate 3.2 million hectares (Gulbahar, 1991: 531). By the beginning of the 1990s, about 2.5 million hectares of irrigation infrastructure was developed in the public sector and an area of about 1.3 million hectares was provided with supplementary water by small scale, privately owned irrigation schemes, making the total area under irrigation about 3.8 million hectares or 45 percent of potential total (Bilen & Uskay, 1991: 4).

A major response to the increasing food and fiber demand in Turkey has been the expansion of irrigated agriculture sponsored largely by government agencies. In contrast to other developing countries, Turkish agriculture has undergone a complete land reform program, in which more than 80 percent of the farmers in Turkey own and work small farms of less then 10 ha. of land (Morvaridi, 1990: 304).

Because of the Mediterranean and semi-arid conditions, with a hot and dry summer, the critical growing period for most crops is during the months of June, July, and August and, during this period, most of the rivers carry base flow only. Water storage, therefore, is indispensable. At present 141 dams are in operation and 57 dams are under construction making about 70 percent of major irrigation projects fed with water from reservoirs or lakes (Bilen & Uskay, 1991: 4-2).

The Turkish government, realizing the crucial importance of a sufficient energy supply for a sustained and balanced economic development, has given priority to the energy sector in its economic policies and adjustment particularly since 1980 (Bagis, 1989: 61). Turkey is steadily increasing its energy consumption, much of which must come from hydrocarbon sources beyond its border. In order to balance the regional deficiencies 220 Gwh of energy was imported in 1990 and 917 Gwh of energy was exported in the same year. In the early 1970's, the high level of dependence on imported oil was a dominant factor in the pattern of energy consumption in Turkey (Bilen & Uskay, 1991: 4-7). Nearly 39 percent of the energy consumed in the nation in 1983 was derived from imported petroleum and, when imports of coal and electricity are also considered, this makes for two- fifths of the all the energy used in Turkey originating from foreign sources. Petroleum imports currently amount to some four billion dollars per year, an amount the equals approximately one third of total imports (Kolars, 1986: 53).

The share of hydro-sources has increased substantially from 30 percent at the beginning of 1970's to more than 40 percent of the total supply recently. In order to maintain this percentage, there needs to be an increase of about eight per cent annum (Kolars, 1986: 53).

The country is water rich and receives about 509 billion cubic meter of precipitation annually, and 38 percent of this ends up as surface runoff, much of which into the USSR, Iraq, Iran, Syria, and the surrounding seas. Turkish estimates indicate that only a little over half of this surface runoff and a billion cubic meter of groundwater can technically be used for domestic, irrigation, and industrial purposes within Turkey. The actual consumption of surface water is 25.2 billion cubic meter per year indicating that only 26.5 percent of surface water development potential is consumed presently while the actual annual consumption of groundwater is 5.4 billion cubic meter (Bilen & Uskay, 1991: 13).

Driven by its need for new sources of energy and because only 20 percent of the hydropower potential has been developed so far, Turkey has turned to the hydroelectric potential of its many rivers, the greatest of which is the Euphrates. With this end in mind Turkey has undertaken a gigantic development project on the river (Kolars, 1990: 59).

As expected, it seems that Turkey, as the upstream state, is the least dependent upon the Euphrates. Even with the development of the GAP project, the great bulk of Turkey's agricultural production will take place outside the Euphrates river system. Politically, however, the GAP is very important to the Turkish government, since, not only is southeast Anatolia Turkey's poorest region but it also contains the bulk of Turkey's Kurdish population, and has been the object of cross-border terrorist attacks by militant Kurds from Iraq and Syria. Turkey hopes that this difficult political situation can be stabilized by improving the local standard of living and ending the support of the local population for Kurdish separatist movement (Briefing, 27 January, 1992, 7; Kolars, 1991a, 4).

This Dam was built for Siberian conditions, where the melting of the snows provides a plentiful water supply, but it is not suited to the conditions prevalent in the Euphrates basin because the turbines are built too high, which means that a small drop in the water level put these turbines out of action (Briefing, 26 March,1990: 18).

The GAP abstraction from the Euphrates might represent from a third to more than one half of the Euphrates "natural flow", but the lowest total amount of water used is estimated at about 10.4 billion cubic meter per annum, according to the GAP mater plan (Bagis, 1989: 52-70). This also assumes that no more than 1.1 million hectares will be irrigated it seems that these figures do not include evaporation from the reservoir, domestic usage and industrial use, so the total water utilization plus losses in Turkey could reach up to 14 billion cubic meter per annum.

It is clear that the river development plan is vital to Turkey from many points of view. It, however, appears that the Turks themselves do not yet know what the total volume of water they will need is. The sizes of the agricultural area which will actually be irrigated as opposed to that plan is not yet know, nor is the required amount of water for each agricultural hectare. Which relates to the method used and crop rotation which has not yet been decided upon? It does not appear that Turkey will use more than 14.5 billion cubic meters annually by 2025 on the basis of evaluation levels of water affected on irrigated land. These estimates range from 10.1 billion cubic meters to the unrealistic 16.9 billion cubic meter of pessimistic Iraqi scientists and journalists (Turan, 1993: 24).

Turkey is petroleum poor but rich in rain fed agriculture and surplus water. If hopes to harness the Euphrates in order to generate electrical energy and to profit from the export of irrigated crops grown with their waters. The total amount of precipitation that Turkey receives is 501 billion cubic meters per year, however only 186 billion cubic meters (37 percent) finds its way into the rivers. Of this amount, 95 billion cubic meters (51 percent) is available as a potentially usable resource but currently, 25.6 billion cubic meters (27 percent) of available water is being used. The Euphrates River contributes 17 percent of Turkey's river water potential (Turan, 1993: 24).

Turkey received 18.5 percent of its GNP from agriculture and the nation is, for all practical purposes, self-sufficient in food. Nevertheless, its government has undertaken a major regional development project the GAP, based upon the utilization of the Euphrates and Tigris rivers. The GAP programmed is the most ambitious development ever undertaken in Turkey and it has profound implications for south-eastern Anatolia which has long been the least developed region within Turkey. The population growth of this region has remained higher then the national average despite the fact that emigration from the region continues. The area referred to as "south-eastern Anatolia" takes up 9.5 percent of the total area of Turkey and 70 percent of the economically active population in the region is employed in the agricultural sector (Kolars, 1991a: 4).

In addition to growth in agricultural population, 7,561 megawatts of hydroelectric power generation capacity will also be created, of which 5,346 megawatts will be on the Euphrates and 2,215 megawatts on the Tigris. In total, the GAP's hydroelectric generating capacity will increase Turkey's present total generating capacity by 70 percent (NewSpot, 28 June 1990: 7). Turkey also sees a great opportunity for electricity exports and the Turkish government has been negotiating with four West Asian countries to export electricity (Parker, 1991: 17).

The Keban Dam and reservoir and the smaller projects upstream from the site were among the first developments to be completed on the Turkish Euphrates. The average annual runoff volume of the Euphrates at Keban is about 20,627 million cubic meters (GAP, 1990, Vol, 4: 30). Depletion of water though, evaporation will be about 985 million cubic meter per year when the 675 square kilometer reservoir is full. The irrigated area was about 35,000 hectares; in 1990, with 58,000 hectares, scheduled for about the year 2000. At that data, it is estimated that depletion of the river flow (Kolar, 1991a: 15).

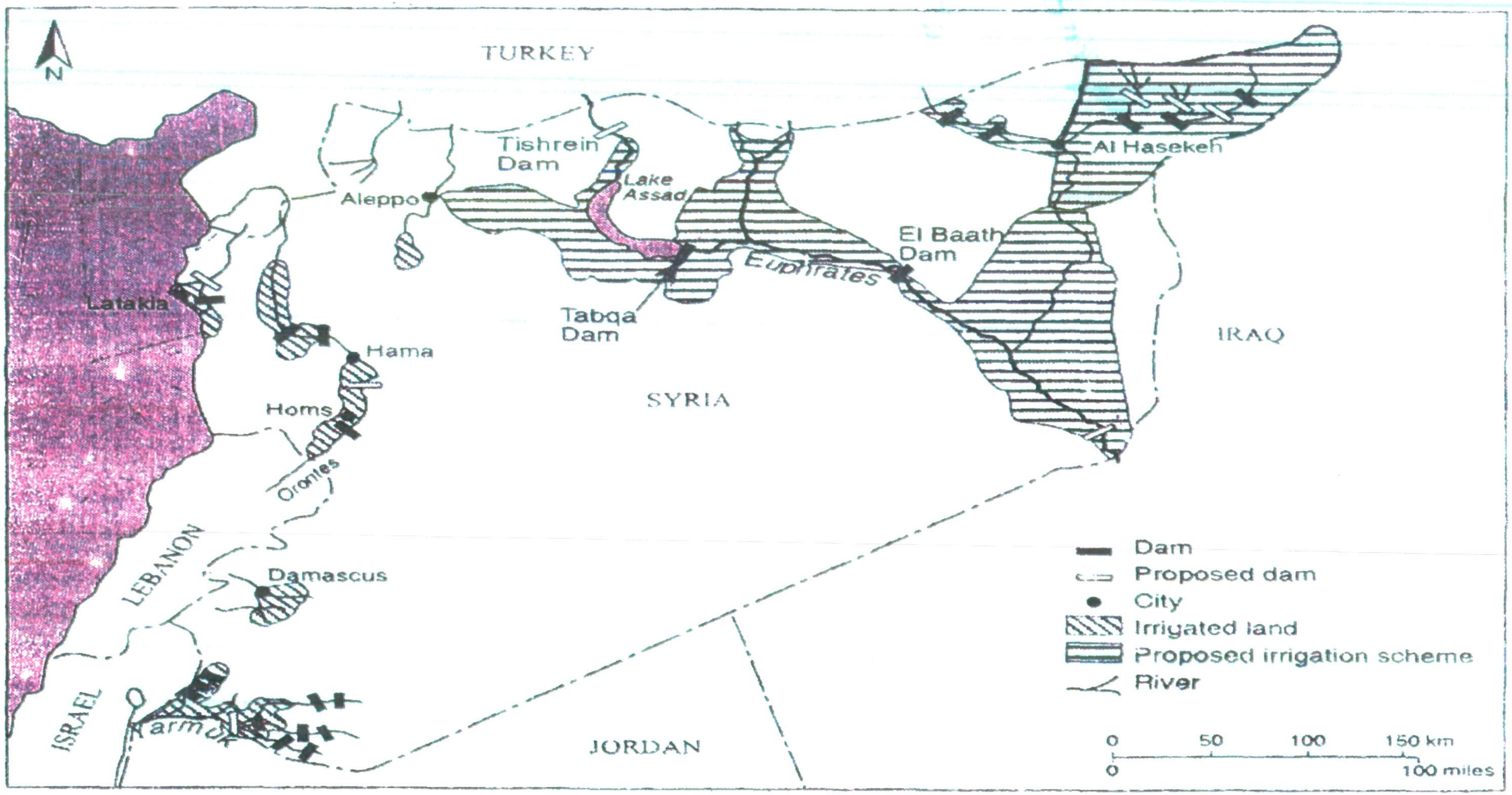
The Lower Euphrates project, which is the core of the GAP, is based upon the Ataturk Dam, 180 kilometer downstream from Karakaya, and its vast reservoir with a volume of 48,700 million cubic meters, and a surface area of 817 cubic kilometer. The average annual runoff volume of the Euphrates at Ataturk is about 26,781 million cubic meters (GAP, 1990, vol.4: 30). The Ataqturk reservoir when it is full may lose as much as 1,470 million cubic meters annually to evaporation (Kolars, 1991a: 16).

4.3: SYRIA

Syria covers an area of 185,180 square kilometer, of which about nearly half is poor steppe or semi-arid land, with 30 percent agricultural land, and only a percent of the agricultural land is irrigated. Potential irrigable land is about 1.6 million hectares with greatest potential located in the Khabur, and the Euphrates projects (Mitchell, 1982: 4). Agriculture retains its position as the mainstay of the Syrian economy despite the existence of a traditionally strong trading sector and partially successful attempts at industrialization.

Irrigation is the only strategy which can make agriculture secure in dry countries such as Syria. Yields from irrigated land can be five times those on rain fed tracts, and a secure water supply enables more flexibility

IRRIGATION AREAS AND WATER PROJECTS IN SYRIA



Source : Soffer, 1999 : 97

in cropping as well as enabling an effective high input and high output system of farming (Allan, 1987: 28).

The irrigation area was estimated at about 280,000 hectares or one eighth of the land under cultivation. Most of the water was derived from river supplies while wells and springs made only a small contribution (United Nation 1949: 22). The 1950s and 1960s saw a considerable increase in irrigated farming with the greatest change during this period occurring along the Euphrates where the use of river pumps enabled large areas of land to be brought under irrigation (Manners & Nejad, 1985: 259).

Since the mid 1980s, there has been a new expansion of irrigated land but, more than 30,000 hectares of old irrigated land were flooded in the reservoir area between 1973 and 1975, and some 4,000 hectares went out of production every year because of increasing salinity in the lower Euphrates valley (Meyer, 1987: 44).

Syria suffers from a shortage of agricultural products, which forces the authorities to increase import of food products from foreign markets (Syria & Arabe, 1988, No-408: 1). This situation was caused by a sharp growth in population and it is predicted that the demand for food will increase by 3.1 percent annually, a figure that is higher than the annual rate of actual increase in food production which amounted in the past two decades to 2.8 per cent (Syria & Arabe, 1988, No-408: 2).

Syria has the potential to feed its increasing population and even export basic food staples such as wheat the barley, but over the last thirty years, the picture in the agricultural sector, despite the bright prospects, has been one of stagnation. Some of the blame for this can be leveled at the adverse climatic conditions that have occurred from time to time, but the problem is also political (Mitchell, 1982: 22).

With population rising at a rate of well over three percent per year for several decades and with changes and improvements in domestic food consumption taking place, at the same time the need to increase food output has been inescapable. As a result policies to improve land, as well as the rural infrastructure and rural institutions associated with agricultural production, have been basic elements in national policy and planning for almost three decades. An increase in production is immediately required to meet the national demand for grain which has resulted from the rapid rise in population (Allan, 1987a: 22).

The storage capacity of the present water projects of the Euphrates River in Syria is about 13.8 billion cubic meters with the Tabqa Dam having a capacity of 11.6 billion cubic meter and all other dams having a total capacity of about 2.2 billion cubic meters. The Water Resources Ministry introduced a policy that aimed at setting up an extensive network of small to medium sized, low cost surface dams throughout the country. These dams collect rainwater during the winter, forming small lakes which water is drawn during the dry summer month. The surface dams vary in storage capacity from 700, 00 cubic meter of water to more then 25 million cubic meter and are mainly used to supply water for agricultural purposes, such as irrigating crops watering livestock and, to a lesser extent, as a supply of water for human use in same of the more isolated rural villages (The Arab Economist, 1982: 20).

Although, the Euphrates accounts for around 85 percent of the nation's surface water resources, in the 1960s probably less than one fifth of the country's irrigated area was located within its basin. Horizontal expansion is probably the one area of greatest potential for irrigation. The Euphrates and Khabur projects will carry cultivation into areas formerly too dry to be economically viable, but, combined with this; there is the effect of irrigation on vertical production expansion. Certain varieties of wheat yield twice as much under irrigation as under rainfed conditions and cotton Yieldson irrigated land is 4.6 times higher than on rainfed land. Horizontal expansion together with vertical expansion, as the result of not only irrigation but also a variety of other factors, holds the key to Syrian future agricultural prosperity (Mitchell, 1982: 22).

The Euphrates project has always had a high political profile for the Baathist regime. Not only is it the showcase of the Ba'ath development drive but, by having the dam-created lake named after him self, President Assad's personal prestige has been attached to it. Administratively, the project is overseen by the High committee for the Euphrates headed by the prime Minister. The Ministry of the Euphrates was specially created to carry out the project and was generously provided with the funds to attract the best personnel at exceptional salaries and at the expense of the traditional agricultural sector (Hinne, 1989: 236).

Syria is the most dependent of the three states upon the waters of the Euphrates since it is the only major river with perennial flow crossing Syria's territory. In contrast to Turkey, Syria relies substantially on Euphrates water for drinking irrigation and industry because the Euphrates accounts for about 85 percent of nation's surface water resources (The Economist, 16-22 December, 1989: 56).

The Euphrates once seemed to offer an answer to Syria's search for new farm land, additional sources of domestic water, and increased supplies of energy. There is simply too much good water in the Euphrates for Syria to ignore it or to turn to inferior alternatives. Syria still remains heavily dependent any available agricultural resources limited as it is the aridity of the country's interior but ambitions plans for irrigated agriculture which are dependent upon the waters-of Lake Assad have been severely curtailed.

While the Euphrates is by far the largest perennial source of water in Syria, its use for both irrigation and power generation has failed to meet that country's expectations although access to its water remains a prime concern of the government and people of Syria.

In April, 1983 Baghdad and Damascus signed an accord where by Syria would take 42 percent of the Euphrates flow once it had left Turkey (MEED, 25 January, 1991). Turkey, under a protocol singed with Syria in 1987, committed itself to giving 500 cubic meters per second to Syria (Brief 2.9 July, 1990: 10). This amount is equal to 15.8 billion cubic meters per year, but according to Syria-Iraqi agreement, Syria's share of this water is about 6.6 billion cubic meters per year and the amount is only 300 million cubic meters per year as the total water needs for Syrian agriculture. This calculation does not take into account the Euphrates tributaries, (the Sajur, Balikh and the Khabur), which have a total additional discharge of about 2 billion cubic meters per year. According to this calculation, the annual of water that Syria will have available from the Euphrates river and its tributaries will reach 8.6 billion cubic meter and so Syria's gross budget will not be in deficit for the foreseeable future (Kolars & Mitchell, 1991: 212).

Only 30 percent of the total area is agricultural land and only 15 percent of this irrigated (MEI, 16 April, 1993: 16). Traditionally, Syria was a net agricultural exporter of wheat, barley and cotton. In 1963 the value of agricultural import was only 27 percent of the agricultural exports but, by 1970, the food trade balance was in deficit and big wheat import accounted for the bulk of the deficit (Syria & Monde Arabs, no 408, 1988: 1).

The Syrian government has pursued several major goals for the agricultural sector which are framed within the context of much broader national development goals such as sustained economic growth, increased national self- sufficiency, full employment and greater social equity and economic well being. The expansion of irrigated areas was to be part of the strategy to reduce dependence up rain-fed cultivation through the development of the water of the Euphrates. The policies have come to be perceived by many as the panacea for Syria's agricultural problems (Manners & Nejad, 1985: 257). Excluding the Euphrates and its tributaries (the Sajur, the Balikh and the Khabur), approximately 119,000 hectares; are irrigated elsewhere in the country in the Orontes, the Yarmuk, the Queik and the Barada river valleys and several smaller streams. These sources are limited and, if used to total capacity, might provide another 175,000 hectares, of irrigated land (Kolars, 1991a: 9).

The first withdrawal of water in Syria downstream from the Turkish border is on the Syrian portion of the Sajur River which rises in Turkey and enters the Euphrates from the right bank. The annual discharge value of the Sajur is about 80 million cubic meter but the small Kayacik Dam and reservoir which can store 46 million cubic meters in Turkey might further reduce stream flow as a result of the irrigation of about 13,700 hectares; at Gaziantep (Bagi, 1989: 56).

The Lake Assad reservoir has a storage capacity, when filled to a height of 40 meter of n11600 million and a surface area of 625 square kilometer (Kolars, 1991a:16). An underground aqueduct leads from a pumping station on Lake Assad to the city of Allepo and carries about 80 million cubic meters for domestic demand (Kolars & Mitchell, 1991: 110). Lake Assad will also serve five or six proposed irrigation districts and 200,000 hectares, recently been proposed for irrigation for areas north and south of Aleppo with water for these fields being taken from Lake Assad as well. Watcr utilization rates of about 12,500 cubic meters per hectare which are anticipated with about 6,750 cubic meters per hectare return flow are based on values computed for similar areas nearby.

The Ba'ath Dam, whose construction began in 1982 and was completed in 1986, was built with soviet assistance, 25 kilometer downstream from Tabqa (An-Nahar Arab Report & MEMO, 19 March, 1984: 20). The storage capacity of the dam is 90 million cubic meters and the reservoir area 2.7 square kilometer (Al-Ba'ath, 21 June, 1988; Kolars & Mitchell, 1991: 153).

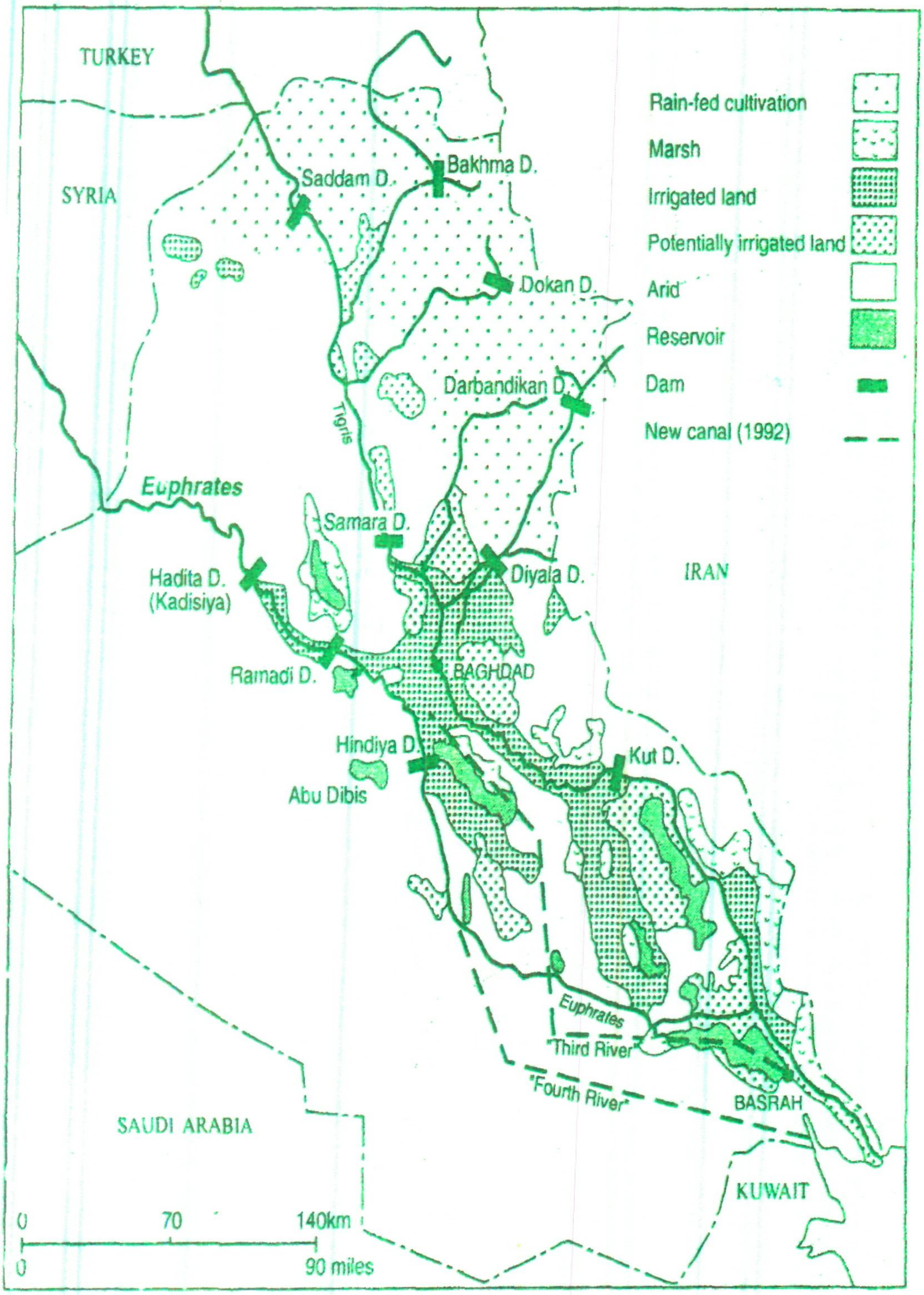
The original Syrian plans to irrigate 640,000 hectares, of land with water from the Euphrates River have been revised downward drastically. All of these downward revisions have been the result of unexpected problems relating to gypsiferous soils, which dissolve upon contact with water leaking from the new canals, thus disrupting the entire system as it is being put into place. Recent estimates by the Syrian government indicate that between 240,000 and 260,000 hectares, of land will be irrigated in the main valley when the projects are completed (Kolars & Mitchell, 1991: 274). If one adds 153,700 hectares, of irrigation land planned for the Upper Khabur to this amount, the potential irrigation land from the Euphrates River and its tributaries will be about 411,000 hectares. The total Euphrates river water depletion after taking into account the return flow and the evaporation losses will amount to about 6.9 billion cubic meters per year (Kolars & Mitchell, 19912: 274-275).

4.4: IRAQ

The alluvial soils of the Mesopotamian plain in Iraq are primarily a product of man's activity during the last six thousand years. They cover more than a third of the country, and are characterized by low elevation, below 100 meters, and poor natural drainage. Large areas are subject to widespread seasonal flooding, and there are extensive marshlands, some of which dry up in the summer to become salty wastelands. Most of this plain has been covered to a depth of several feet with sediments brought in suspension by irrigation water thus the soils are not pedagogically developed in the usual sense (Clawson, 1971: 68-75).

The total area of Iraq is 43,750,000 hectares, of which 11,800,000 hectares, is arable. Of this area 35, 00,00 hectares are irrigated and

IRAQ LAND USES



Source : Soffer, 1999 : 104

3,350,000 are rain fed on average each year. The total area under cultivation rose from 3.2 million hectares in 1984 to 3.6 million hectares in 1985 is the irrigated land that is cultivated covers 1,560,000 hectares, and the cultivated land in the rained area is 1,300,000 hectares (Hussain, 1990: 238).

Two types of agricultural activity predominate in Iraq, one dependent upon rainfall in the north and the other dependent upon irrigation in the south. The rain zone which is watered by rain is also divided into two sub zones: the mountain area which is located along both the Iraq- Turkish and Iraqi- Iranian border, and the steppe zone (Al-A'ni, 1977: 422).

The best known agricultural product is the date, of which Iraq is one of the world's largest producers. Other crops include barley, wheat, linseed, lentils, and beans, as well as rice, sesame, maize, and millet while cotton production is hampered by soil salinity. Total agricultural production was 13.9 million tones in 1985, compared with 13.1 million tons in 1984. The total area of both forest and pasture is 1,800,000 hectares (Fisher, 1989: 466).

A large land area, a small rural population and a generous endowment of water resources appears to offer the possibility of rapid and rewarding expansion in agriculture. Under proper resource management, Iraq could offer the greatest opportunities in the region for agricultural growth (Clawson, 1971: 52). The expansion of irrigation has contributed to serious drainage problems since the additional water, combined with shallow gradient of the terrain from above Baghdad to the gulf, has raised the water table and brought salts closer to the surface, affecting plant growth. Some observers believe that as much as 65 percent of irrigated areas have had salinity problems and that 20 to 30 percent of the irrigated land has been abandoned over the years because of it (Nyrop, 1979: 157, EIU, 1989-90: 21). In fact, however despite its high agricultural potential, Iraq is not self sufficient in food production and almost 25 percent of all Iraqi imports were taken up by food in 1990 (Hussain, 1990: 237).

Because of the ready availability of agricultural land, wasteful, 'extensive' farming methods which give a low yield are common; thus only one sixth of potentially cultivable territory and 3 percent of the country's total area is in use. There can be no doubt that the mounting costs of the war and the increased rural-urban migration caused by it were virtually the main reasons for the increased deterioration of the agricultural sector (Mofid, 1990: 50).

Agriculture retains its position as the mainstay of the Iraqi economy, despite the existence of a traditionally strong trading sector and partially successful attempts at industrialization (Clawson, 1971: 52).

Iraq claims it needs 13 billion cubic meters per year from the Euphrates for its agriculture. As we have seen, however, the estimates of water consumption range between 10.2 million cubic meters per year (with improvement in irrigation methods used today).

Iraq's big advantages over Syria are that it can add better quality Tigris waters to the depleted Euphrates and the river's headwaters have not been subject to major impoundment by dams in the same way as the Euphrates. A scheme completed in 1988, allows water from Lake Tharthar, north of Baghdad, to flow by canal to the Euphrates (The Economist, 16-22 December, 1989: 56). However, Abdul Satar Salman, the Iraqi Deputy Minister of Agriculture and Irrigation declared in an interview for the Kuwaiti paper Al-Kabs (1990), that the water in the Tharthar basin was saline and that irrigation from would cause an increase in salinity levels, which would impair soil fertility and possibly cause a decrease in agricultural cultivation in the Euphrates basin (Al-Kabs, 27 February 1990: 18).

Iraq controls the downstream and estuary areas of the Euphrates River so it feels particularly concerned about any projects undertaken in Turkey and Syria which might affect the final water flow. It seems that Iraq is mainly concerned about the years of drought in the Euphrates basin when the water volume in the river is less than the average. In such a case Iraq will be the first country to be affected by such shortages. Furthermore, any long-range Iraqi planning must consider the drought that periodically affects the river system, approximately every four years, and must be prepared for a serious reduction in available water resources. The second critical period began in 1970 and ended in 1975, with the lowest flow being in 1973 when the annual flow fell to 62 percent of the annual average flow (Bagis, 1989: 42).

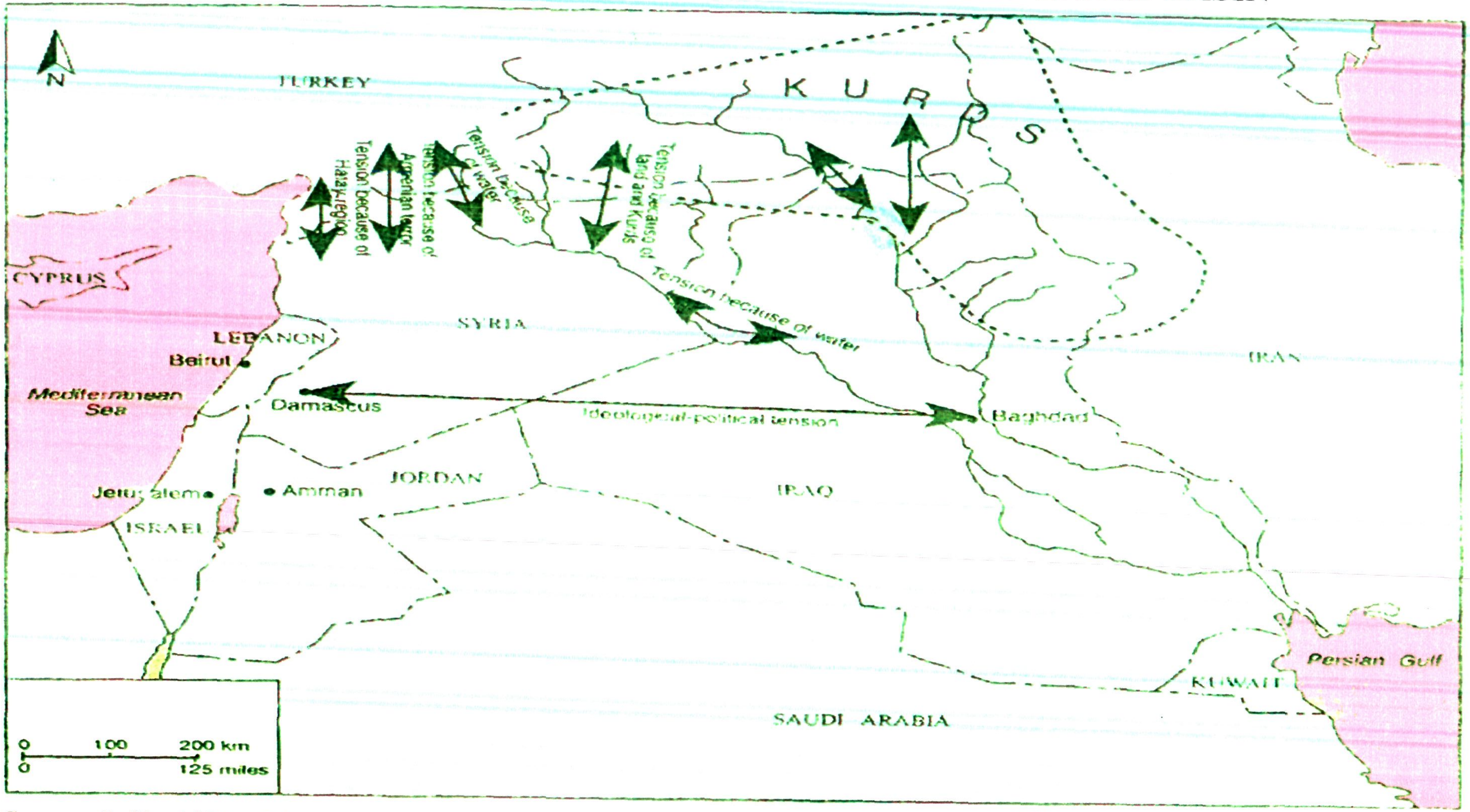
It is estimated that the amount of water Turkey will use in the future will reach as high as 14-14.5 billion cubic meters per year and the annual amount of water utilized by Syria will reach 6.9-7.5 billion cubic meter. Combining the potential demands of Turkey and Syria we arrive at total ranging from 21 to 22 billion cubic meters per year. This amount will allow an annual amount of about 11 billion cubic meter of water to flow into Iraqi territory, an amount almost matching the Iraqi demand for Euphrates water. Eventually, this quantity of water will reach Iraq only in the years when the water volume in the river goes beyond 32.5 billion cubic meters. The amount of water Iraq is capable of transferring from the Euphrates-Tigris through the Tharthar Canal reaches 7.3 billion cubic meters per year, therefore Iraq's water potential along the Euphrates River reaches 18 billion cubic meters a quantity of water which all would agree is enough to supply the water needs of Iraq in the river basin. However, it seems that Iraq feels confident about future water availability since it reached an agreement in 1980 with Jordan to contract a system to divert 160 million cubic meters per year of the Euphrates water to northern Jordan in order to aid Jordan to overcome its increasingly grave water deficit (EIU, 4th Quarter, 1980: 16).

Although in oil-rich Iraq agriculture accounts for less than 10 percent of the GNP in an economy which is dominated by the petroleum industry elaborate plans and efforts have been made to continue to manage the river (EIU, July 1980, 56). The main system providing water for irrigation are based on the Euphrates and the Tigris and officials in Baghdad share the belief that, once the waters of the Euphrates and the Tigris are fully utilized through dams and reservoirs, the area of cultivated land in Iraq will be almost doubled (Briefing,15 January,1990: 7).

Iraq has a relatively small population, but has the largest number of inhabitants of the three riparian living within the Euphrates valley. Iraq also contained the greatest area of irrigated land within basin but faced the most severe agricultural and water related problems of the three riparian. Iraq's great and water resources appear to offer the possibility of rich agricultural development, and its hydrocarbon endowment seems to provide the financial resources for investment generally and for rapid industrialization (EIU, July 1980: 59).

Iraq, being a lower Euphrates riparian country, is in a very vulnerable position vis-à-vis Turkey and Syria. In order to estimate the average "Natural" River flow, it is necessary to add the amounts of water diverted from the flow measured at several points below all major tributaries. A report from the International Bank for Reconstruction and Development, in which estimates of irrigation diversions in Turkey, Syria, and Iraq were made, estimated "natural" river flow as follows. The measured river records at Hit Iraq for the period 1937-1964 showed a total average of 29.24 billion cubic meter per year, net diversion in Turkey plus the "return flow" from irrigation was 1.49 billion cubic meters per year, and the net diversion in Syria of 2.96 billion cubic meters per year. According to this account, the total "natural" amount of Euphrates river flow at Hit should be 33.69 billion cubic meters per year (Clawson, 1971: 205).

GEOPOLITICAL, CIRCLES IN THE EUPHRATES-TIGRIS BASIN



Source : Soffer, 1999 : 109

(E). GEOPOLITICS OF THE EUPHRATES-TIGRIS RIVERS BASIN

A deep study of the conflict between the states concerning the sharing of Euphrates river water teaches us that the subject of water cannot be isolated from broader geographical historical, political and economic issues. Thus is needed to understand the true importance of hydro-political on the background of the complex of relations between states.

The examination of the relations among the riparian states shows the importance of four factors. These factors include the respective policies of the three states toward the amount of water to be drawn from the Euphrates-Tigris river, the Kurdish question, the rivalry between the Iraqi and Syrian branches of the Ba'ath party, and Syria's history of animosity towards Turkey.

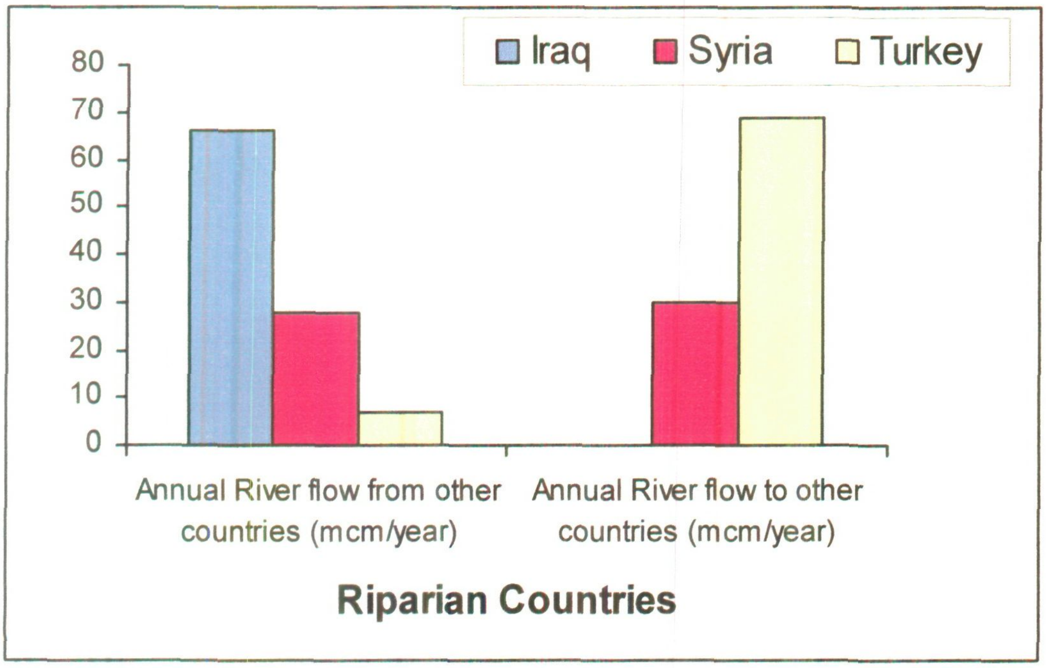
Table No-4.5

Shared Water Resource in the Euphrates River Basin

Riparian countries	Annual River flow from other countries (mcm/year)	Annual River flow to other countries (mcm/year)	Total Water Resource (mcm/year)	% of total flow originating outside the boundary
Iraq	66.0	0.0	109.2	66
Syria	27.9	30	53.2	79
Turkey	7.0	69	19.1	3.5

Sources: The World Almanac and Book of fact, 1997, Mahrab, New Jersey: World Almanc book, pp. 892.

Graph 4.5: Shared Water Resource in the Euphrates River Basin

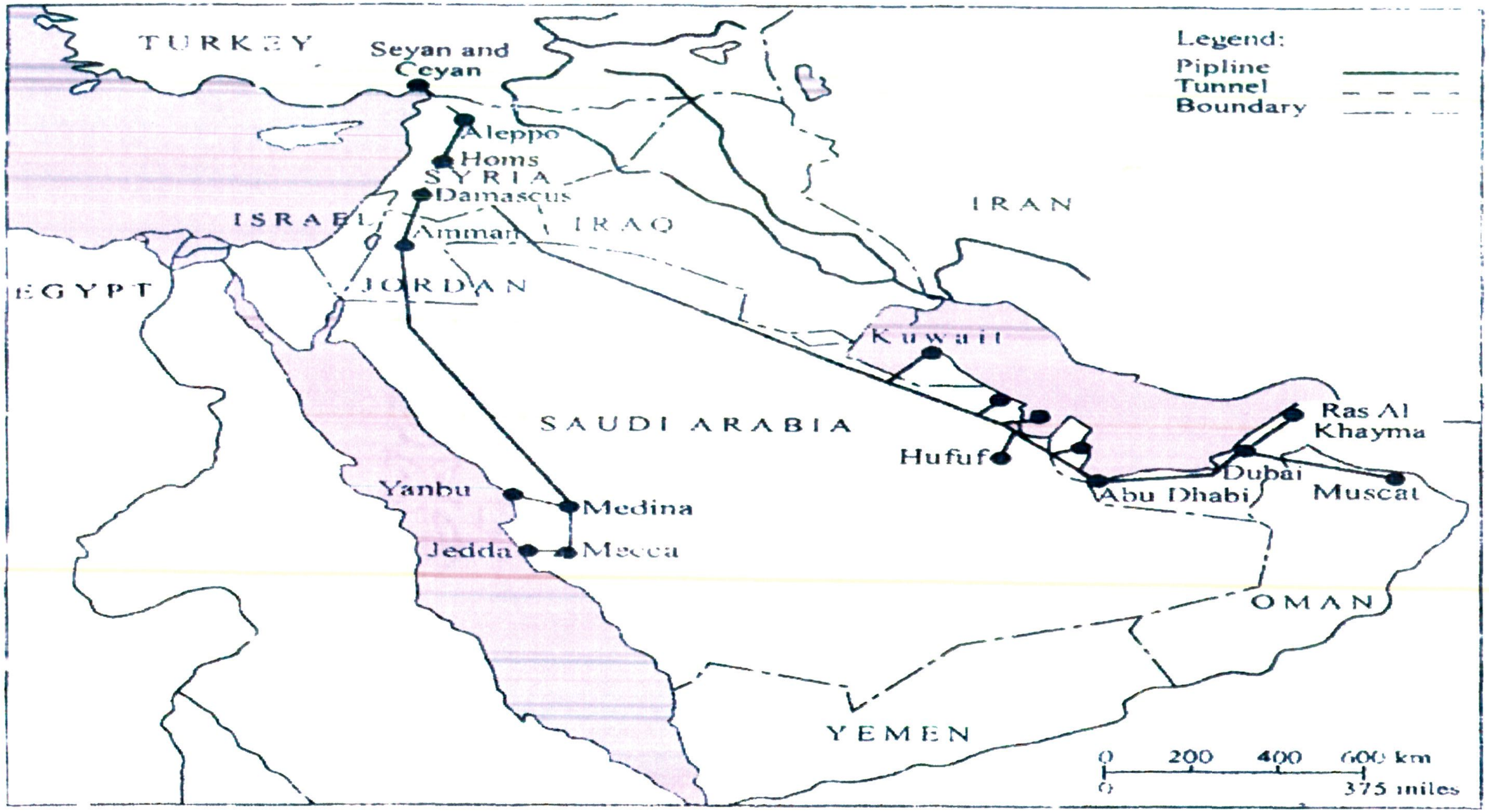


4.5: DISPUTES BETWEEN TURKEY AND SYRIA

The sources of the difficulties in achieving a real improvement in relations between Turkey and Syria up to 1991 undoubtedly lies in the dichotomy of Turkey's membership of NATO and Syria's reliance on support from the former soviet union. In other words, the confrontation between East and West is reflected in the West Asia in general and in Turkish-Syrian relations in particular. Even though this tension has reduced by the world-wide softening of the Cold War, it has not completely disappeared.

Relations between the two countries have not been cordial since 1939, when France, then the mandatory power in Syria, handed the area around Alexandrite over to Turkey as a bribe to enter Second World War on the side of the allies. Turkey accepted, but then stayed neutral. Syria has never accepted this territorial loss and Syrian maps still show the territory as part of Syria. Damascus has never been able to hide the fact that it considers Turkish sovereignty over the Hatay as illegitimate (Bolukbasi, 1990: 27). Ali Mustafa, the Syrian consul general in Istanbul, argued, in 1985, that Syrian maps still included Hatay region within Syrian borders because "

THE PEACE PIPELINE



Source : Soffer, 1999 : 238

Syria does not accept the present frontiers which were drawn up in Hatay through a referendum, because that referendum was conducted following an agreement between Turkey and France. In addition to this, the consul declared that Syria's hostility was at least partly due to Turkey's GAP project, and the construction of the giant Ataturk Dam that would harm Syrian interests. He added that the controversy concerning the sharing of the Euphrates waters should be solved according to the rules of international law governing the joint use of rivers and other waterways (Bolukbasi, 1990: 27). Until the late 1970s diplomatic relations remained "correct", yet both sides knew that the state of affairs could best be described as "peaceful coexistence". Perhaps because of this background Syria has been willing to permit anti-Ankara Kurds and leftist opposition groups to use its territory as a base for operations, and Ankara has sometimes angrily admonished Damascus on the issue (MEI, 16 February, 1990: 13; Balukbasi, 1990: 3). The subject of Syria's helping Turkish opposition groups during the 1970s by arming them and sending them and sending them back secretly into Turkey has aroused the most severe displeasure in the Turkish administration. Evidence has also been put forward suggesting that Syria had helped Armenian terrorists, and during the 1980s had similarly provided arms for Kurdish terrorists.

In December 1986, Turkish police claimed that they had discovered Syrian-backed terrorists operating to blow up the Ataturk Dam (The Middle East, October 1987: 27). The Turks reported that there were three training camps in northern Syria housing militants belonging to the "Armenian Secret Army for the Liberation of Armenia" (ASALA) and the PKK, and that Syrian agent, disguised as diplomats, had delivered arms to ASALA militants in various European countries. On 17 September 1986 the PKK Central Committee held a meeting Damascus where it decided open more increasing its operations, especially its crossings of the Turkey-Syrian border into Turkey (Bolukbasi, 1990: 24-41). The Syrian Prime Minister

Abed Al-Rauf Al-Kasm state in 1986, that Damascus was unable to prevent PKK incursions into Turkey because Syria, with a long frontier, had no army in the north, since it was needed to watch the enemy in the south. Thus, although Syria was doing its best to avoid friction with Turkey, they could not keep the border under strict control (Bolukbasi, 1990: 34). In July 1987 the Turkish Prime Minister Ozal went to Damascus and two months later Kadurra the vice-prime Minister of Syria, went to Turkey. At these meeting, a protocol for "cooperation on security problems " was singed, bringing up a number of bilateral matters dealing with the prevention of the smuggling of goods across the common border, the cross-border trade in counterfeits money and the return of fugitives to the country from which they were escaping (Lewis, 1991: 73). In addition discussions were held on the prevention of terrorism. Particular attention was given to the important problem of regulating the water of the Euphrates. As a result of his visit Ozal proposed Turkish help in the prospecting for gas and oil in Syria, presented a project to supply electricity to Syria if Damascus needed it, and suggested that increased trade and economic cooperation would benefit both countries. His major proposal was, however, the installation of the peace pipelines (Bolukbasi, 1990: 43).

On 21 October 1989, two Syrian MIG-21 fighter plane killing two pilots and three technicians. Syria argued that its pilots had disobeyed orders and Ankara accepted Damascus explanation, but many suspected that Damascus was in fact trying to scare Ankara so that Ozal would not dare to use the "water weapon". All these were perceived by Ankara as a Syrian attempt to build up tension between the countries in order to force Ankara to revise its "water policy", and agree to Damascus' demand to sign a treaty to formally share the water of the Euphrates (Bolukbasi, 1990: 50).

The visit of Syrian Foreign Minister, Farouq Al Share, to Ankara in March 1991, marked a new phase in the relations between the two countries. These relations, often strained in the past because of the issues of the water of the Euphrates and cross border security, have vastly improved since the two countries found themselves on the same side of the fence during the Gulf crisis; but Hafez Al-Assad, the Syrian president, ordered his soldiers in Lebanon to leave the PKK base alone because he wanted the camp as a bargaining chip against Turkey which he feared could use the Euphrates dams to cutoff Syria's water (The Sunday Time ,13 October 1991: 24).

The Turkish Interior Minister, Ismet Sezgin, visited Damascus on 17 April 1992 and, as a result, Turkey and Syria have drawn up two protocols aimed at improving joint border security and removing the PKK from the Bekka (The Guardian, 18 April 1992: 12). There was a visible desire on both sides to overcome the traditional problems which had beset bilateral relations in the past (Briefing, 25 March.1991:9).

4.6: TENSIONS BETWEEN TURKEY AND IRAQ

According to the Turkish National pact adopted by the last Ottoman parliament on 28 January 1920, the Mosul area had to remain within the Turkish border. On first May 1920, Mustafa Kemal (Ataturk) declared that this would be the case in 1925; however Britain, bearing in mind the oil fields in the Mosul area and the strategic importance of Iraq, decided that the whole of the Mosul area was to remain in Iraq. Turkey did not participate in the council of the League of Nations at which this decision was taken unanimously and was not in a position at that time to consider changing the fait accompli, which would have meant going against Britain, so instead, she re-opened of talks with Britain in 1926. In exchange for certain concessions, Turkey accepted the decision of League of Nations, and signed the "Treaty between Turkey, the United Kingdom and Iraq concerning the establishment of the border between Turkey and Iraq", thus putting an end to the dispute over this border (Lewis, 1991: 29). Since then, the two countries have been on fairly good terms although the Turks still say that the oil producing area Mosul should have been allotted to them after First World War rather than being incorporated into the new Arab state of Iraq, then under British mandatory rule. Since the 1926 agreement, however, there has not been a single territorial dispute between these two states (MEI, 16 February, 1990: 13).

Turkish-Iraqi relations made very rapid progress from the mid 1970's until the end of the 1980's on both the economic and political fronts and, after April 1982, Turkey because the major outlet for Iraqi oil. In 1977 a first pipeline was laid from Kirkuk in Iraq to Yumurtalik in Turkey and, by the end of 1984, the Kirkuk- Yumurtalik pipeline's capacity had been extended from 700, 00 barrels per day to 1 million barrels per day. In 1985 Iraq and Turkey began building a second pipeline through Turkey which was completed by June 1987 increasing oil exports via Turkey from 1 million to 1.5 million barrels per day. Thus nearly half of Turkey's annual 20 million tonnes of oil imports comes from Iraq as well as 280 million dollars in royalties per year for the oil transported via these pipelines. Without the Turkish outlet, Iraqi oil exports would have come to a virtual standstill long ago (Inan, 1999: 89-51; Bolukbasi, 1990: 22).

Turkish-Iraqi cooperation reached its climax when both sides singed the security protocol in October 1984 where by Iraq granted Turkey the right of "hot pursuit". The protocol allowed forces from either country to pursue "subversive groups in the territory of the other" up to a distance of five kilometers, thus Turkey could continue pursuing members of the PKK into Iraq and, in August 1986, Turkish planes first bombed camps set up by the terrorist organization on the Iraqi side of the border (Lewis, 1991: 70; Bolukbasi, 1990: 21). During his Baghdad visit in April 1988, Ozal declared that the Turkish-Syrian agreement was a temporary one and that the real treaty would be reached through tripartite talks to be held by the three countries (Bolukbasi, 1990: 39).

The failure of the respective governments to reach an agreement over oil prices has led to a drastic decline in trade between Iraq and Turkey. In 1989, Turkish exports to Iraq were reduced to one quarter of what they had been in 1987, and imports from Iraq (95 percent of which were oil), were halved. Turkish exports to Iraq in 1988, when the trade volume was at its peak, had consisted mainly of live animals, poultry and eggs, cereals, chemicals, and iron and steel products (Erengul, 1990: 15).

Following Iraq's invasion of Kuwait on 2nd August 1990 and Turkey's compliance with the subsequent embargo resolution of the UN, the pipelines were closed, but the Kirkuk oil installations and the Iraq-Turkey pipeline survived the Gulf war undamaged (Lewis, 1991: 69).

4.7: HOSTILITY BETWEEN SYRIA AND IRAQ

Relations between Iraq and Syria in the 1940s and 1950s were characterized by asymmetry. Iraq, the stronger of the two, with significant economic resources, a stable leadership, and ambitions for the dominance of Syria, was capable of intervening and affecting Syrian politics. Syria was relatively unable to affect Iraqi politics and is politicians were pleased to receive financial and political assistance from Iraq. Between 1955 and 1958, relations between the states took on an ideological dimension and the main motive for Iraqi activity in Syria during those years became more and more defensive: to prevent Syria from joining the anti-Iraqi, pro-Egyptians camp. The rise to power of the Ba'ath parties in both Syria and Iraq intensified the rivalry between the two countries by adding the dispute over the legitimacy of their respective regimes (Eppel, 1991: 3).

The increasing consolidation of the structure of the Syrian regime bilateral relations in 1972 entered a calmer period that, nonetheless, was marketed by serious and narrow conflicts of interest (Kienle, 1990: 170). Given the lack of democracy and, the inability to maintain legitimate opposition activity, the forces and personages opposing the regime in each state found asylum within the rival country. Syria persistently encouraged and assisted Iraqi group which opposed Saddam Hussain and his regime, including the Kurdish opposition operating from Damascus. Assad's opponents and Syria's enemies likewise received assistance from Baghdad and, since the early 1970s; Iraq has been granting assistance to ant- Syrian gropes (Eppel, 1991: 6).

In 1975, relations between the two countries reached a crisis level over economic interests, involving such questions as the pipeline from Iraq to the Mediterranean and the division of the water from the Euphrates, and this led to the massing of military forces on the Iraqi-Syrian border. In April 1976, after the breakdown in negotiations over fees for the transit of Iraqi oil across Syria and the price for supply of Iraqi crude. Iraq cancelled the transit agreements and cut off oil supplies until February 1979 when a new agreement was reached and supplies resumed (Drysdale, 1990: 351; EIU, Syria, 1991-92: 34). It is in this respect that side issues and side payments became especially important. One of these already manifested itself in the mid- 1970s, and that was the deal made between Iraq and Turkey to construct an oil pipeline from northern Iraq to the Mediterranean in Turkey. This was seen by Syria as a hostile act, which threatened the existing, economically vital pipeline through Syria and part of Syria's intransigence towards Iraq over the Euphrates must have stemmed from this affront (Waterbury, 1990: 18). During the 1970s and they 1980s, Iraq frequently accused Syria of withholding up to 60 percent of Iraq's share of the Euphrates water but Damascus denied this.

Ever after the loss of its Gulf ports at the Iran-Iraq war Iraq was able to use both the Turkish and Syrian pipelines. Although the Syrian pipeline was damaged at the beginning of the war it became operational again by December 1980 and, in 1981, Baghdad was exporting 500,000 barrels per day through the Syrian pipeline. Syrian-Iraqi relations which had already started to deteriorate after the aborted unity attempts of 1978 and 1979, however, reached their lowest point during the beginning of 1982 and, by early 1982, the Iraqis felt that Syria was not only supporting Iran in the Gulf War, but was trying to bring down Sddam Hussain as well (Bolukbasi, 1990: 18). In July 1982, when Iraq had recaptured most of the Iranian territory and carried the war into Iraq, Syria also pressured Iraq by shutsting down the Iraqi oil pipeline which carried oil to Banyas and pressured Iraq by shutting down the Iraqi oil pipeline which carried oil to Banyas and Tripoli in Lebanon as well as closing the Syrian-Iraqi border. With the loss of the Syrian pipeline the only remaining outlet for Iraqi oil exports was the Turkish pipeline, but the closure of the Iraqi-Syrian border also forced the shut down of the Turk-Iraqi railway, which passed through Syria, and was used by Iraq to import European goods (Bolukbasi, 1990: 18).

Before Iraq invaded Kuwait on August 2, 1990 and annexed the Emirate there had been signs of a possible rapprochement between the two Ba'athist rivals, Syria and Iraq. The two sides found common ground on issues such as the sharing of the Euphrates water, and the Israeli problem. Iraq was important to Syria as its strategic depth against Israel and as an Arab partner in its relations with Turkey in the dispute over the Euphrates water. The Iraqi invasion of the Arab state of Kuwait was, for the Syrians, clear proof that their previous suspicion regarding the nature and tendencies of Saddam Hussain and his regime were correct. The immediate Syrian response to Iraq's invasion of Kuwait on 2 August 1990 was a call for the urgent convocation of the Arab summit conference (EIU, Syria, 1991-92: 8). An Iraqi success in Kuwait would have tripped the balance of forces even further to Syria's disadvantage, endangering the status and survival of Assad's regime and, perhaps, that of Syria in general. The attempt to forge a united opposition front against the Ba'athist government in Iraq was finally resurrected in December 1991 (EIU, Iraq, 1992, No.1: 8).

(F) THE WATER CRISIS OF 1989-1990

Iraq and Syria have often complained that Turkey is opposed to a trilateral accord which would partition the Euphrates water among the three countries. The fears of Syria and Iraq seemed justified when on 29 November 1989, Turkey shocked its downstream neighbours, by announcing that it would hold back the flow of the Euphrates for one month from 13 January 13 February, 1990 for essential hydraulic works at the reservoir behind its newly built Ataturk Dam, (The Economist, 16-22 December, 1989: 55; Briefing, 15 January, 1990: 4). Turkey restored the flow some 36 hours ahead of schedule, on the night of 12-13 February but the damage that this stoppage described as an act of international piracy would inflict on Syria and Iraq was only the beginning, for the complete filling of the Ataturk reservoir would still take four to five additional years (MEI, 16 February, 1990: 12).

Syria and Iraq had made diplomatic attempts to get Turkey to review its decision and reduce the period of one month, which they considered too long. Syrian technicians believed that a period not ten days would be enough for the Ataturk Dam to carrying out the essential hydraulic works and Iraqi technicians also thought that ten days to two week would be sufficient. Almost all the Gulf newspapers launched a simultaneous campaign to attract attention to the water-cut, calling for Turkey to reconsider its 'requirement', while some went to the extent of associating this act with Turkey's hostility to wards Syria over that country's support for separatist terrorism. Observers at the Turkish Foreign Ministry, at the beginning, stated that the campaign was a result of pressure exerted by Damascus and Baghdad on other Arab capitals but, later, they changed this observation, claiming that both Iraq and Syria "understood the technical requirements of Turkey" (Briefing, 15 January, 1990: 5). Officials in Ankara claimed that Turkey had tried to do all it could to minimize the hardship to its southern neighbors (Briefing, 25 December, 1989: 9). January and February were the months chosen by Turkey to hold back the flow of the Euphrates because water needed for irrigation in Syria and Iraq and evaporation losses are minimal during these months (Utlcan, 1990: 12). The declared that Turkey had released 3.43 billion cubic meter of water, or an average of 780 cubic meters per second from the Keban and Karakaya Dam systems, over 52 days starting from 23 November 1989 to 13 January 1990, in order to compensate for the losses that might accrue to these two countries during the following month. If we take into account the total make-up and low-flow periods of 82 days starting from 23 November 1989 till 13 February 1990, we can see that an average quantity of water passing through the Turkish-Syrian border was 531 cubic meters per second or 3.76 billion cubic meters. However, according to Turkey, Syria and Iraq got more water during the 82 days and there was actually an increase in the amount of water, instead of a decrease. During the 31 days of closure, the Euphrates River was fed by the downstream tributaries like Goksu, Araban, and Nizip and the long term average of these tributaries is about 120 cubic meters per second (Utlcan, 1990: 13).

This, officials in Ankara claimed, amounted to 500 cubic meter per second running across the border which, if used cautiously, could be stored for thrifty use in order to overcome any discomfort. They declared, however, that this should not be judged on a daily or weekly basis, but as a monthly average (Briefing, 25 March, 1991: 10). They also noted that Turkey had displayed good will towards its neighbors by providing an average of 500 cubic meters per second a month during the 1989 summer months, when turkey itself had suffered one of the worst droughts for the past fifty years (Briefing, 25 December, 1989: 9). The total amount of water that passed through the Turkish-Syrian border was 25.7 billion cubic meter, whereas the natural flow for the same period was calculated at 20.8 billion cubic meter. The difference between these figures, (4.9 billion cubic meters) was made up by releasing water from Keban and Karakaya reservoirs, to maintain the level of flow (Utlcan, 1990: 13).

These displays of goodwill however, do not appear to have appeased officials in either Damascus or Baghdad. Syria's Minister for Information, Mohammed Salman, was quoted in the press as saying that the most important problem his country and Turkey concerned the sharing of the waters of the Euphrates. He was also quoted as saying that he hoped this question would be resolved through "peaceful means", and it was sufficient for Ankara to detect an "unfriendly tone" (Briefing, 25 December, 1989: 10). The Syrians and Iraqis had a real grievance. They thought the Turk had no more right to use Euphrates water than they had and were simply seizing what they wanted: that is the lion's share (The Economist, 16-22 December, 1989:55). By reducing the water flowing in the Euphrates River, Ankara would be directly showing Baghdad and Damascus that it controlled things in the region. According to the MIE report (1990), Turkey, in complete defiance of international law, was doing it pleased simply because it was the strongest country involved (MEI, 16 February, 1990: 13).

In a rare show of unanimity, both Damascus and Baghdad unequivocally rejected Anakara's claims. Syrian officials argued that water rationing had to be instituted in northern Syria and that power supplies had been disrupted as a direct result of the Turkish action while Iraq complained that 7 million of its citizens had been affected by subsequent shortages.

The Iraqis also claimed that the reduction in the Euphrates level would affect 13 million hectares of rich farmland, (40 percent of Iraq's arable land), and would force Iraq to shut down four power plants which produced 40 percent of the country's electricity (MEI, 16 February, 1990:12; MEED, 25 January, 1991:10). Shaker Bazaoua, the director-general of Syria's Al-Thawara Dam, believes the Ataturk Dam will eventually cut the Euphrates's flow by two-thirds. "There is no longer a river, the Euphrates is dead. In the future, people will visit the Euphrates valley and say. There used to be a river there (Tekeli, 1990: 221). Olcay Unver, who is the GAP regional project director in San Liurfa, stated that Turkey was not required by law to send 500 cubic meters per second into Syria but claimed that this was done as an act of goodwill. "Syria was pleased at first but now both Syria and Iraq are demanding 700 cubic meter per second from Turkey, which more or less amounts to demanding the Sentire supply as the total, "natural flow" is something over 900 cubic meter per second". In an interview with Cumhuriyet, Inan he underlined the

Turkish position by comparing Turkey's military situation with that of its neighbors putting it bluntly, he said: "we have the water and they have the water and they have the missiles" (Briefing, 15 January, 1990: 6).

The ruling Ba'ath socialist party's newspaper "Al- Thawara" warned that Turkey's action of blocking the river for a month would seriously harm Iraq and could cause 'a real agricultural disaster' in the long term, adding that Ankara-Baghdad relations could suffer. Al-Thawara reported that seven provinces with 5,000 villages inhabited by about 5.5 million people would be threatened by the severe water shortage caused by the Turkish action. Iraqi officials believed that the Euphrates flow could eventually be reduced from its current 32 billion cubic meters per year to 11 billion cubic meters per year or two billion cubic meter per year less than Iraq claimed was its minimum requirement. Although Ankara had increased the flow of the Euphrates by 100 percent over the normal flow of 500 cubic meter per second into Syria to compensate for the loss of water during the cut-off period, it made little difference because Iraq had already filled its Al-Qaddissiya dam to capacity to make up for shortages during the summer growing season claiming that villages and towns in the area north of Al-Qaddissiya dam would not be able to make use of that water (Turkish Daily News, 15 January, 1990, Al; Baghdad observer, 15 January 1990:1). Turkish officials claimed that Turkey had given Syria 3.4 billion cubic meters since November, but Syria had released only 860 million cubic meters to Iraq during the same period (Bolukbasi, 1990: 53).

Iraq's concern, however, led it to seek help from its partners in the Arab cooperation council, in the form of exerting pressure on Turkey. Both Baghdad and Damascus tried to find supporters among other members of the Arab League and the secretariat of the League actually made an announcement in late January 1990 calling for a just partition of the Euphrates waters and requesting Turkey to reconsider its decision to divert the river for a month. The Turkish Foreign Minister, Mesut Yilmaz, reacted to these diplomatic moves by asking the Iraqi and Syrian ambassadors in Ankara to get their government to stop trying to internationalize the issue and turning other Arab states against Turkey. In addition, Ankara sent delegations to Arab capitals to explain why Turkey had diverted the Euphrates (Bolukbasi, 1990: 55; MEED, 26 January 1990: 13).

Officials in Ankara believed that what was actually disturbing Syrian and Iraqi officials was the effect on their public when they observed Turkey's ability to cut water off at will. They felt that this would be interpreted in Syrian and Iraqi public opinion as a show of strength by Turkey and a sign of weakness by the regimes of Hafez Assad and Saddam Hussein (Briefinf, 25 December, 1989: 10). But, even if the cut-off were due to technical requirements, and had no political motivation who could guarantee that this would be the case in the coming years or in the case of a serious regional crisis?

In April 1990, According to MEED 1991, Baghdad and Damascus signed an accord by which Syria would take 42 percent of the river's flow once it had left Turkey. However, as in all fifteen meetings of the Syrian-Iraqi-Turkish joint commission on the Euphrates held over the past ten years, finding a solution has remained elusive. Here, the talks reportedly broke down over the volume of water to be discharged by Turkey and the decision to carry on with the negotiations. The Turkish side presented a three-phase plan at the 1990 meeting of the Technical committee, outlining the course that had to be followed to resolve the question. In addition, current projects were to be reviewed in order to conform to the principle of optimal usage. This plan was rejected by both Syria and Iraq who insisted that there was no need for such intricate measures and that supplying water on the basis of unilateral declarations of requirement would be sufficient. Baghdad demanded the release of 700 cubic meters per second instead of the 500 cubic meters per second offered by Ankara and Iraq indirectly, but clearly, stated that they could have sorted out their problems with Syria and

Turkey not spoiled thing by not giving enough water (MEED, 25 January, 1991; Brefing, 26 March, 1990, 18 &2-9, 1990: 10). Both countries are critically dependent on the Euphrates, and therefore wish to conclude some form of binding arrangement with Turkey which would involve quotas for the amounts of water from this for each of the three countries.

Before further negotiations could take place, Iraq's invasion of Kuwait took place and the Euphrates water issue was eclipsed by other pressing concerns. Turkey was under pressure to cut the flow of the Euphrates and Tigris rivers in an attempt to drive Saddam Hussain out of Kuwait. Water could be viewed as Iraq's Achilles heel and the denial of water was a possible means of ensuring a swift and bloodless end to the Kuwait crisis (MEED, 25 January, 1991: 10). There were, however, clear threats made by Saddam's son (who was the Minister of Energy) that if Turkey stopped giving Iraq its required water, they would know what to do (Frankel, 1991: 261). The Turkish authorities have repeatedly said they do not intend to use the river as a political or military tool against their neighbours to the south and their behaviors during the gulf crisis and war of 1990-91 appears to confirm that Turkey is pursuing a long–term policy which does not introduce any unnecessary increments of tension and resentment to relations with its downstream riparian. The Turkish press claimed during the Gulf war that the Ataturk Dam represented a prime military target (Dateline, 18 August, 1990: 1).

4.8: POSSIBLE WATER ALLOCATION APPROACH

The use of the Euphrates-Tigris Rivers by three respective countries has been the subject of diplomacy and commentary ever since the dissolution of the Ottoman Empire and the consequent disruption of the political unity that had previously inhibited the conflict with respect to the Euphrates-Tigris basin. However, until 1970s, there was no significant complaint or conflict over the sharing of water in the basin region. The rapid growth of population and policy of food security and self-reliance as a natural economic goal have surface the demand of water in the basin region. In view of these, the three riparian have launched many water development projects over the year to achieve the natural economic goal of this has created tension in the basin region over the sharing of water. Little effort has been made to coordinate planning and no formal agreement has been reached regarding the allocation of water. Each state has built its own projects especially multipurpose once for electricity, irrigation, flood prevention, and storage (Meyer, 1987 : 45-48).

The portions of the Euphrates-Tigris basins located within each riparian state are illustrated Turkey has the major share of the discharge of the Tigris and of the Euphrates. Iraq has nothing of the Euphrates discharge, but has the principal share of the discharge of the Tigris tributaries. Syria has nothing of the Tigris discharge, but has the chief share of the discharge of the Euphrates tributaries (the Khabur and the Balikh), and it uses their water. Turkey contributes 72 percent of the total discharge. Iraq contributes 18.5 percent, and Syria's contribution is no more than 2 percent (See table). If we regard the Karun as part of the Euphrates-Tigris system, then Iran is in third place and contributes about 7.5 percent. (Bakour & Kolar, 1994 : 128-131).

If we fix the division of water according to the proportions of discharge contributed by each state, Turkey and Iraq have the main rights to exploit the water of the Tigris, and Turkey and Syria have main rights to exploit the water of the Euphrates. However, the division is not determined only according to discharge; Iraq has historical rights to use the water of the two rivers (Lowi, 1995 : 46).

A fair division of the water must be accomplished according to the needs of the states. Turkey and Syria are greatly in need of hydroelectric power. In Syria this situation could change because gas and oil have recently been discovered there, which would enable Syria to employ thermal energy instead. Turkey has no sources of energy apart from hydroelectric. Turkey and Syria need water for irrigation to reclaim large areas of land for their growing populations. Until recently, Iraq needed water for irrigation, but this situation could soon charge because Iraq has large amounts of oil, which could be used to boost industry and so curtail agriculture.

A fair division of water would allocate about 40 percent to Turkey, about 50 percent to Iraq, and about 10 percent to Syria. This distribution based on discharge, historical rights, and existence of other resources requires cooperation among the riparian, which would ensure not only an equitable division of the water but also its quality (Dolatyar & Gray 1999 :119-124).

However, in reality the three states do not cooperate, and the up stream states (Turkey and Syria) make use of their advantage over the downstream state (Iraq). Turkey is an upstream state in the drainage of the two rivers. Syria is a downstream state of the Euphrates relative to Turkey, and an upstream state relative to Iraq. (Iran has a certain advantage in the two tributaries of the Tigris, the Diyala and the Little Zab, which originate in its territory, but has no intention of establishing water project or using these tributaries owing g to the very difficult topography at their sources.) Iraq is a downstream state of the Euphrates-Tigris. But it has another advantage; in case of need, it can transfer water from the Tigris to the Euphrates and back again. In fact, Iraq is now completing construction of a project to transfer water from the Tigris to the lower Euphrates (Ionides, 1937 : 18-117).

(G). SOUTH-EAST ANATOLIAN PROJECT GAP (GUNEYDOGU ANADOLU PROJESI) A PARADIGM SHIFT IN WATER RESOURCES DEVELOPMENT

GAP, initiated in 1965, is Turkey's largest and most ambitious development project in the south-eastern part of the states. The development region covers 28,520 square miles, including six regions. Most of the development area borders Syria and some of it border Iraq. Five and a half million people inhabit the six regions as of 1991, 50 percent Kurds, about 40 percent Turks, and 10 percent Arabs (Elhadj, 2008: 6). In 1980 about 68 percent were farmers and the remainder were industrial workers and service workers (Kolars and Mitchell, 1991; Toepfer, 1991).

Table No-4.6

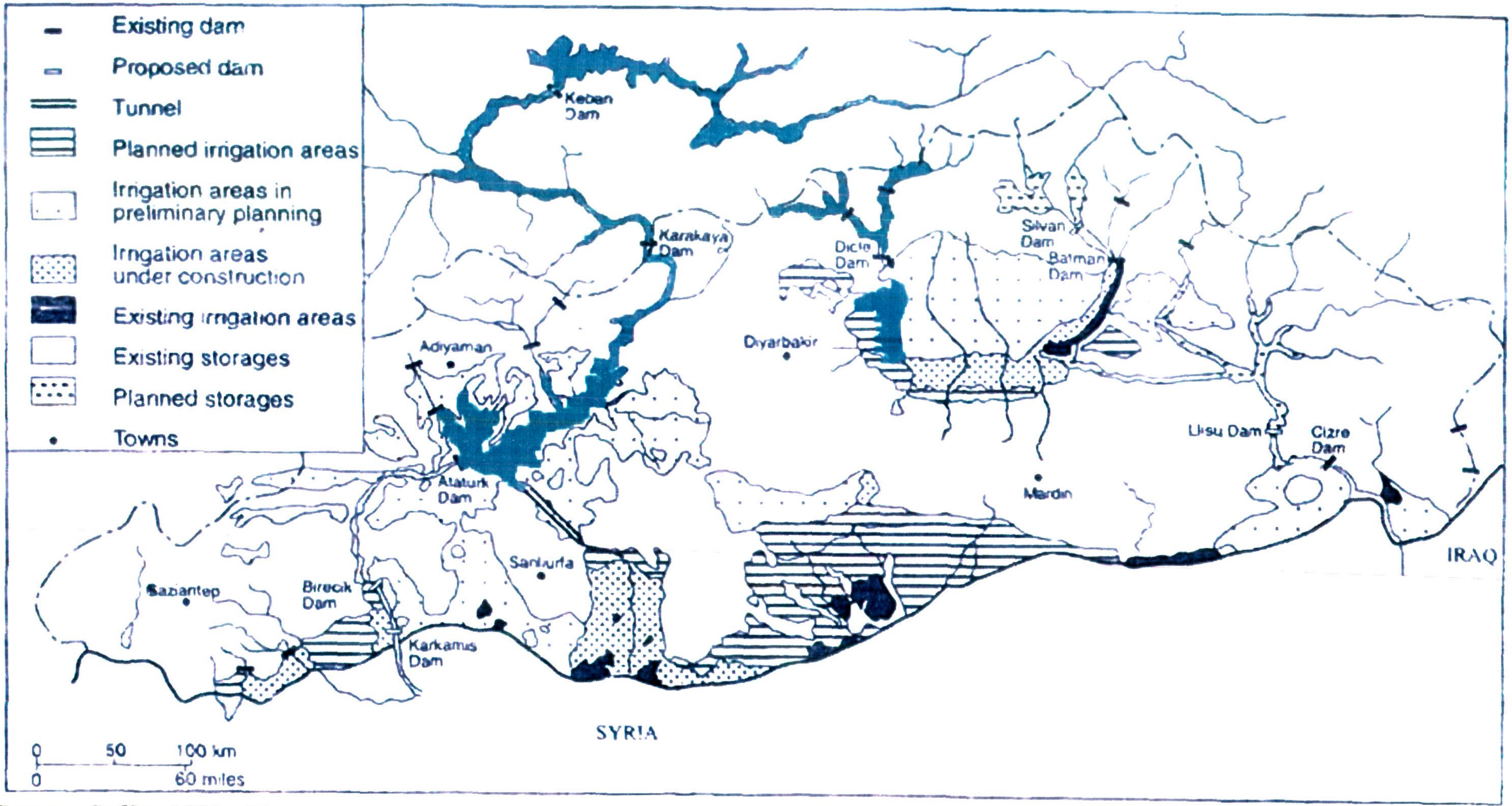
Comparison of the GAP region and Turkey by selected indidices (1985)

Index	Unit	Turkey	GAP Region	GAP Share (%)
Land Area	Cubic kilometre	779,459	73,863	9.5
Total population		50,664,458	4,303,567	8.5
Population growth (1965-85)	% p.a.	2.4	2.9	--
Population density	/cubic km	65	58	--
Urban population	% to Total	53.0	49.9	--
Economic structure	%inGDP/GRP			
Agriculture		17.7	39.6	(9.0)
Manufacturing		25.2	11.7	(1.9)
Gross domestic product	10^9TL	83,785,419	3,365,559	4.0
Per capita GDP/GRP	10^3 TL	862	862	(47)

Source: GAP, 1990, Vol. 1,1

The project is intended to transform the South-eastern part of Anatolia, an area of plains and hills with a semiarid climate, into the "bread basket" of Turkey by irrigation millions of hectares. Other goals are to advance the economically and socially weak population and bring it closer to the west; to lift the region out of a state of chronic developmental backwardness directly into twenty-first century by producing ample electricity, which will be used to industrialize the region; and by paving a new road network connect the region with the western part of the state. The Turkish government hopes in this way to integrate the Kurds into the Turkish core and to attenuate separatist processes there, which have spread into other parts of the country, sometimes in a violent fashion (Kolars & Mitchell, 1991: 56).

GAP SOUTHEAST ANATOLIA



Source : Soffer, 1999 : 90

GAP has been conceived and implemented as a means of integrating water resources development with overall human development in one of the backward regions of Turkey. The project area lies in South-eastern Turkey, covering nine provinces corresponding to approximately 10 percent of Turkey's total population and an equivalent surface area. The project area includes the watersheds of the lower Euphrates-Tigris Rivers and the upper Mesopotamian plains (Naff & Mastan, 1984: 93). The water resources development program of GAP includes 13 groups of irrigation and energy projects, seven of which are on the Euphrates River and six on the Tigris. The project includes 22 dams, 19 hydropower plants, and irrigation networks, on the Euphrates and Tigris river basins, to irrigate 1.7 million hectares of land. The total cost of the project is estimated as USD 32 billions of which have already been invested (Beschorner, 1992: 39-40).

As an integrated regional development project based upon the concept of sustainability, GAP covers investments in such fields as urban and rural infrastructure, agriculture, transportation, industry, education, health, housing and tourism, as well as dams, power plants and irrigation schemes on the Euphrates-Tigris rivers. This massive launch for development has special emphasis on and priority for the economic, social and cultural advancement and well being of the whole country in general, and of the people of the region in particular. The basic objectives of the GAP are: to remove interregional disparities in the country by alleviating conditions of abject poverty and raising the income levels and living standards in the region; to enhance productivity and employment opportunities in rural areas and to improve the population absorbing capacity of larger cities (Ministry of Foreign Affairs of Turkey, 1995: 19).

As the GAP has shifted over the years from an infrastructure development project, into a project that coordinates social, cultural, economic and environmental efforts, its changes have followed the changes in global thinking about development. In recent years there has been an increased focus on reducing poverty as a key responsibility of government for development. International conference such as the 1992 United Nations Conference on Environment and development in Rio de Janeiro and the 1995 World Summit for social Development in Copenhagen have put forward ideas about sustainability, gender equity, encouraging grassroots involvement, protecting the environment, and so on. These initiatives were reinforced at the UN Millennium General Assembly when the Millennium Development Goal of halving the proportion of the world's population living in extreme poverty by 2015 was agreed by all member countries of the United National. Other goals and targets specific to water and poverty were agreed at the Millennium Assembly and at the World Summit on Sustainable Development 2002, (Turan & Kut, 1997: 141).

These international attempts have generated some consensus about the priorities for development-reaching the poorest targeting marginalized groups, involving target groups at all stages in the project cycle-that has led to the adoption of policies in support of sustainable development in countries in both North and South. GAP has attempted to incorporate these ideas into its activities, and has learned first hand about the tension between how development should look, and how it is actually carried out (Olson, 1997: 169-170).

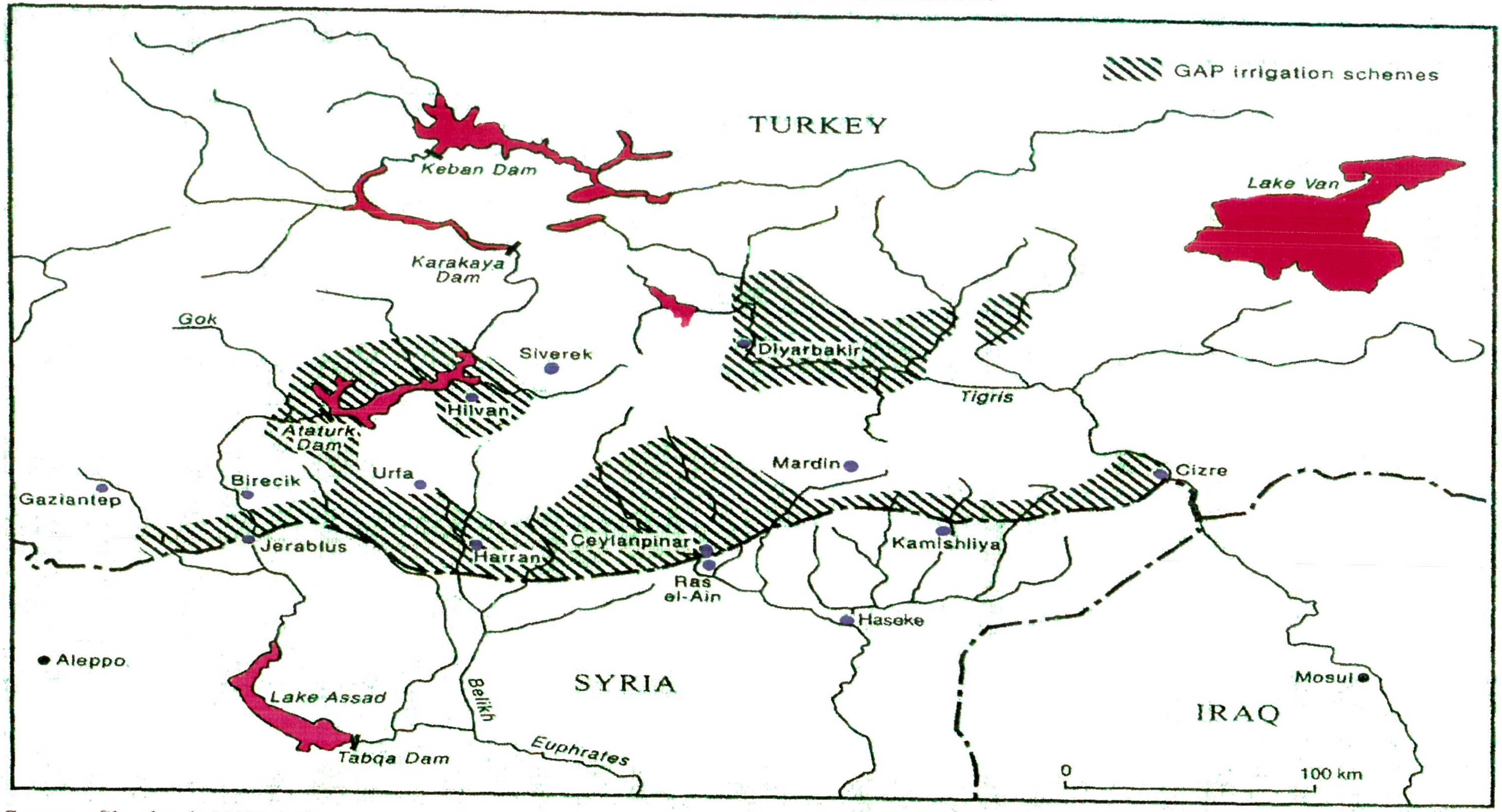
Water based development is a catalyst for economic, social and environmental changes. In the GAP, water resources development has enabled human-centred development in the shape of agricultural and other rural development, economic development and entrepreneur support projects, gender equality projects, participatory resettlement, and other activities that are based on the concepts of participation, equity, and environmental and social sustainability. GAP, as such is defined as a sustainable human development project, where water resources development is not an end in itself; it is, indeed, a means to an end. The end is to alleviate poverty, improve quality of life, and to maintain the integrity of environment and the ecosystems (Unverand; Gupta & Kibaroglu eds., 2003).

The concept of sustainability is very relevant to any analysis of water policy. Hence, in the case of GAP, the notion of sustainability is captured in the large context of the sustainability of society, the economy as well as the environmental services provided by water in the region. Sustainable human development, as applied by the GAP for South-eastern Anatolia, encompasses such goals as reaching the poorest, gender equity, capacity building for local institutions, and environmental protection. It is from this philosophy that GAP derives its human centred focus, using the momentum gained from hydropower and irrigation infrastructure projects to bring opportunities for more sustainable livelihoods to as many in the GAP region as possible (Elhadj, 2008: 6).

The main components of sustainability for GAP are: social sustainability, physical and spatial sustainability, environment sustainable development approach of GAP. Special programs and project have been initiated to emphasize the human dimension of development through project implementations concerned with basic social services, gender equity, urban management, irrigation facilities, agricultural and environmental sustainability, institutional and community capacity building, and public participation (Beschorner, 1992: 39-40).

GAP case illustrates that in the field of water development and management the three countries in mention can exploit the potential areas for cooperation by benefiting from the experience and practices of one another, and develop these into common practice (GAP Regional Development Administration, 2008a: 5).

GAP IRRIGATION SCHEMES



Source : Shapland, 1997: 112

(H) UTILIZATION: THE THREE-STAGE PLAN

Lake of data on the water and land resources in transboundary basin areas is the major obstacle to the efficient and reasonable utilization of water riparian countries. The Euphrates-Tigris basin is not immune to the difficulties caused by this obstacle. There is not much reliable and detailed date on flows and water quality, the quantity and quality of agricultural lands, patterns of irrigation and crops and additional relevant information. One of the immediate effects of the lack of reliable data on water resources is that the total amount of water declared by all riparian states needed for their activities exceeds the amount of the average water flows of both rivers. Hence, it is nearly impossible to make reliable and appropriate decision concerning the efficient utilization of the basin's waters (Kibaroglu, 2002: 253).

In order to overcome these obstacles and to ensure basin-wide cooperation on the efficient utilization of the waters, Turkey proposed a plan called Three Stage Plan for Optimum, Equitable and reasonable Utilization of the Trans-boundary Watercourses of the Euphrates-Tigris basin at the second tripartite meeting of the ministers on June 26, 1990 in Ankara. As can be observed in its title, the Three Stage Plan mainly used the similar terminology developed by the International Law Commission of the UN during the codification of the 1997 framework Convention on the Non-Navigational Uses of International watercourses. Hence, the plan was built on the needs-based approach versus the rights-based approach (Ministry of Foreign Affairs of Turkey, 1995: 35-37).

Indeed, the history of the Three Stage Plan dates back to 1960s. The outline of the plan was completely formed by the engineers of the Turkish General Directorate of States Hydraulic Works (DSI) in a much more comprehensive manner. This outline included three working groups on hydrology, land resources and engineering, each composed of experts from the riparian states (KIbaroulu, 2002: 253; Tomanbay, 2000: 95).

The Three Staged Plan is based on two basic principles. The first is that Turkey considers the Euphrates-Tigris as a single system since the two rivers merge in Iraq to from the Shatt al-Arab waterway and the waters of the two rivers can be used interchangeably because of the collection, interpretation and evaluation of the data, thereby leading to disparities, it is argued that the inventory of the basin's water resources and land resources should be drawn up and evaluated jointly by the three riparian states to realize the most optimum and reasonable utilization of water resources (Ministry of Foreign Affairs of Turkey, 1995: 37).

Three Stages of the plan are the same vein, to end the Euphrates-Tigris dispute over the utilization of the waters of these rivers, in 1984, Turkey proposed a just and equitable settlement that would satisfy the parties not only for today but also for future generations. This proposal was based on actual and objective data. The proposal aimed at continuous cooperation to strengthen regional peace and the well-being of the people of all three countries. The Turkish proposal submitted to the Joint Committee in 1984 did not receive any response though the aim was just and equitable utilization taking into the aim was just and equitable utilization taking into account such factors and circumstances as mentioned in the UN Convention, like the length of a river in the territory of a riparian state and its ratio to the total length of the river, evaporation, lands to be irrigated and their efficiency, techniques to be used for irrigation and means of saving water, economic and social contribution of the utilization of water, economic and social contribution of the utilization of water to the region and to the country, etc.. (Umut, 2006: 8-9) A group of experts from the three countries would implement this plan which had three fundamental features; namely, inventory studies of water resources, inventory studies of land resources, and, the evolution of water and land resources. In the resource inventory, data on the level of water discharge, rain and snowfall, temperature, evaporation etc. would be collected, exchanged and checked on a monthly, seasonal and annual basis. In the land resources inventory, information on the quality of soil and drainage criteria would be exchanged and crop patterns would be evaluated according to the soil quality of soil and drainage conditions. As to the final phase of evaluation of water and land resources, parties would discuss types and systems of irrigation that would minimize water losses and system of irrigation that would minimize water losses and seek ways to modernize and increase the efficiency of irrigation projects. The demand and supply balance of water would be analyzed and, if necessary, the possibilities of transferring water from Tigris to Euphrates would be considered to meet consumption demands. To this end, possible projects would also be discussed and evaluated from the point view of their viability. It would be observed that the Three Stage Plan is based on objective criteria and may be applied to settle disputes for an optimum and fair utilization of water with justice and equity (Umut, 2006:8-9)

Although it might have proved successful in facilitating negotiations, the Three State plan was rejected by the downstream riparian sates. Nevertheless, it had several advantages that cannot be easily discounted. First, it was a promising plan to overcome the main obstacles in employing standardized data in the negotiations among the riparian states and for efficient utilization of the basin's waters (Turan, 1993: 25). It would have been reasonable to irrigate the lands of higher soil quality in order to get higher efficiency in water consumption. Second, the Three Staged Plan was offering some sort of "concealed compromise" among the riparian states (Kut, 1993: 13).

(I). RECENT DEVELOPMENTS

The GAP project has alienated Syria and Iraq from Turkey and left the two states in a relatively weak position. In simple terms, the situation can be characterized as fellows: Iraq feels it is at the mercy of Turkey and Syria, both of whom have the power to prevent Iraq from obtaining enough water. Syria shares this position because once Turkey completes the GAP it will have such power over both its neighbour (Cohen, 1991: 514).

Syria and Iraq find themselves in a common position for two other strategic reasons. First, they continue to harbor anti-U.S. sentiments that have diminished among several of their neighbors in the region over the last decade (Seattle, 2001: 3). Jordan and Egypt, for example, have both made significant steps to reach out to the West in recent years. Following the Gulf War, Saudi Arabia and the other Arabian Peninsula states have also forged closer ties to the United States. Even the new regime in Iran has shown signs that it wishes to improve relations with the United States. Meanwhile, Iraq remains under a United States trade embargo and Syria has not made significant overtures to the West.

Second and arguably more importantly-Syria and Iraq have become the two most virulently anti-Israel states in the West Asia (Seattle, 2001: 3). The peace process has normalized Israel's relations with Jordan and Egypt, but Syria still demands the return of the Golan Heights, which Israel seized in 1967 (The Times of India, 2001: Feb. 16).

Meanwhile, Turkey has significantly improved relations with Israel, further alienating Syria and Iraq. Turkey and Israel have been conducting joint military exercises since 1996, understandably raising serious concern among the Arab states. Recently, Turkey's interest in these endeavors has cooled- the Turk pulled back on a pair of planned projects, but this along has not eased Arab concerns (Turkish-Israeli Military Cooperation, 2001:

Mar.5). Earlier this year, Israel and Turkey also agreed on a ten-year deal that would send Israel fifty million cubic meter of Turkish water annually. The water will come from the Manavgat River, which flows into the Mediterranean (Metehan, 29 January, 2001.). Although Syria and Iraq have no claim to this water, they see the move as an affront- and a security threat- because they believe Turkey is using too much Euphrates and Tigris water. A Syrian or Iraqi official might ask Turkey why it is not using Manavgat water domestically instead of selling it, leaving a fair share of Euphrates and Tigris water for Syrian and Iraqi use (Ed Blanche, 1 February, 2001). From an economic perspective, however, the deal makes sense for Turkey because Israel can more easily afford to pay for the water than Syria or Iraq.

For these reasons, a strategic analysis would predict that Syria and Iraq would begin to reconcile their differences and create a common front to oppose Turkey. This has, in fact, been the case in recent years, as Syria and Iraq have normalized relations with each other and jointly criticized Turkey's construction of the GAP (Agence France-Presse, 1997: 30 Sept.). Both countries have been actively seeking support from the Arab League by demanding that Turkey consult with them over water rights... the Arab League issued several resolutions to this effect, claiming that Turkey was allowing too little water to reach its neighbors and that the water coming from Turkey was polluted. Turkey largely disregarded these claims, citing the fact the Kurdish leader Abudllah Ocalan was residing in Damascus, (Turkish Daily News, April.1, 1996) despite Syria's 1987 promise to stop supporting the Kurds.

In 2001, Syria and Iraq signed two key bilateral agreements intended to strengthen their alliance. On January 31, 2001, the two states reached a new water-sharing agreement. The details of the agreement have not been publicized, but according to Iraq it covers "a formula for sharing the waters of the Euphrates between Iraq, Syria, and Turkey and an agreement to draw up a formula on sharing he Tigris waters between Iraq and Syria" It is the first such agreement since 1990, when Syria promised to leave fifty-eight percent of Euphrates water to Iraqi government, never replied (Reuters, 2001: 29 Jan.). Also on January 31, Syria and Iraq signed a free-trade agreement reportedly worth U.S.$1 billion annually. The agreement includes the reopening of an oil pipeline from Iraq to Syria's Mediterranean coast and will likely be a huge boost to an Iraqi economy suffering from international trade sanctions (Christian Science monitor, 23 February, 2001).

It should be noted, however, that recent developments have not been completely one-sided, as there have been signs that Turkey is willing to cooperate with its lower riparian neighbors. A key event occurred in 1998 when Turkey threatened Syria with military action if Syria continued to shelter Kurdish rebels. Syria agreed to expel Ocalan, who was later captured by Turkey, and the two states signed a security agreement with Syria agreeing to stop supporting the Kurds (Turkish Daily News, 2001: 26).

Following the agreement, the two states began improving relations by holding a series of talks on several bilateral issues including water rights. In August 2001, Syria and Turkey signed an agreement to cooperate on the GAP, although Turkey made no specific commitments regarding the amount of water it would release (Turkish Daily News, 2001: 26). Additionally, in September, the two states signed a second security agreement, which did not touch on water issues but will strengthen bilateral relations (Turkish Probe, 2001: Sept). This newfound spirit of cooperation demonstrates that Turkey is willing to work with its neighbors, but wants to gain something in return-in this case, Syria's expulsion of Ocalan. As a Syrian official has stated, "Matters are getting better and moving forward with serious steps...(but Syria is) still looking for a just and reasonable share of water according to international law (Turkish Daily News, Jan26, 2001).

(J). THE JOINT TECHNICAL COMMITTEE

The bilateral and trilateral talks among the riparian states could be interpreted as efforts to decrease the level of tension resulting from the water management projects that all three riparian states began to implement in the 1960s, and as the search for accommodation among the co-riparian states. In these terms, the *Joint Technical Committee (JTC)* meeting provided an important platform to share information and view among the riparian states after 1980, albeit a weak one institutionally (Kibaroglu, 2002: 227).

As mentioned before, Turkey and Iraq agreed to form a Joint Technical Committee in 1980 to discuss and finalize the water issues between the two sides. After the first bilateral meeting in May 1982, the JTC began to convene on a trilateral basis with participation of Syria in 1983. From then on, the main objective of the Committee was to study matters on the utilization of regional waters among the three riparian states.

The JTC was authorized in defining methods and processes to determine reasonable amount of water needed by each riparian. For that reason, the main issues on the agenda of the JTC were the exchange of basic hydrological and meteorological data regarding the Euphrates-Tigris Basin, sharing of information on ongoing construction of dams and irrigation schemes, and discussing the plans about the impounding of Karakaya and Ataturk Dams which were under the construction during that period (Kibaroglu, 2002: 227).

At first sight, it could be argued that the JTC meeting has not been successful in resolving political and legal disputes among the riparian states. Syria and Iraq continuously demanded that Turkey increase the Euphrates flow of 500 cum/s guaranteed by the 1987 protocol up to 700 cum/s. Turkey, on the other hand, has been arguing that the current amount would be more than sufficient if the downstream riparian states adopted water-saving irrigation technologies and if Iraq's transfer of water from the Tigris to the Euphrates were to be added into the calculations (Gruen, 1994: 267). In addition to these, two central issues could not be resolved during the JTC meeting, ultimately leading to the Committee's failure. The first one was whether the Euphrates and Tigris Rivers should be treated as a single system as Turkey argued, or whether the talks would be treated as a single system as turkey argued, or whether the talks would be limited to the Euphrates River as put forward by Iraq in particular. The second issue, more important than the first one, was whether the final objective of the JTC was to formulate a proposal for sharing the basin waters, or to set up a trilateral regime for the utilization of the basin water (Kut, 1993: 11-110).

The JTC failed to perform its mission after 16 technical and two ministerial meetings. The 17th meeting in Ankara in June 1993 was cancelled when Syria decided not to attend. After a long break, the three sides agreed to initiate technical talks among the water experts who would report to the related ministries during the trilateral ministerial meeting on March 22, 2007 in Antalya. Since this date, the experts of the three riparian states meet periodically in Trilateral Technical talks (Minister of Foreign Affairs of Turkey, 2007a: 2).

Although they did not prove successful in resolving the disagreements and fostering cooperation, the JTC talks have provided some benefits to the riparian states. First, the Committee meeting functioned as a channel of communication by bringing the issues to the table and discussing the concerns and positions of the riparian states. Second, the three sides recognized that the issues on the agenda were more complex than they appeared. Lastly, vital hydrological data and been "more or less" discussed (Kut, 1993: 9).

In 2008, Turkey Iraq and Syria agreed to restart the *Joint Trilateral Committee* on water for the three national for better water resource management. Turkey, Iraq and Syria signed a memorandum of understanding on September 3rd 2009. In order to strengthen communication within the Euphrates-Tigris Basin and to develop Joint Water-flow-monitoring stations. On September 19th, 2009, Turkey formally agreed to increase the flow of the Euphrates River to 450 to 500 cu. Cms., but only until October 20th, 2009, in exchange, Iraq agreed to trade petroleum with Turkey border region. One of Turkey's last large GAP Dams on the Tigris the Ilisu Dam is strongly opposed by Iraq and is the source of political strife (Turkey to up Euphrates flow to Iraq).

(K). CONCLUSION

The discussions in this chapter clearly indicate that in contrast to what is conventionally believed, first, water resources have never been the root cause of military conflict in Mesopotamia and, second, since antiquity, hydraulic civilizations which flourished in the Euphrates-Tigris basin have been forced to cooperate and coordinate their collective efforts in a systematic way in order to control the two mighty rivers for the sake of all beneficiaries. This argument is supported by several hydrological and historical facts.

- First the annual discharge of the two rivers has been more than enough to provide for the needs of all riparian communities.

- Second according to archaeological evidence, the hydraulic civilizations of Mesopotamia not only invented the most suitable tools for efficient water utilization such as the wheel, windmill, and pipe, but also developed a remarkable water management system, through extensive networks of dikes, canals and reservoirs.

- Third, these civilizations had the social prowess and well-established legal institutions required for maintaining the functionality of their organized water systems and preventing conflict.

Despite recent alarmist warnings by commentators and their conflict representation of hydro politics in the Euphrates-Tigris basin, in marked contrast to the Jordan River basin, none of the riparian countries is facing an imminent water shortage.

There has been no military conflict between the three riparian states of the Euphrates-Tigris basin and no violent water conflict has marked their relationship. Indeed, the three parties have been engaged in a continuous, active, and critical dialogue and technical consultations since the early 1960s.

Analysis of water diplomacy in Mesopotamia indicates that there are several factors which strongly militate against the outbreak of conflict in the future.

- First, the actual water demand of all three riparian countries in the foreseeable future will be less than originally projected.
- Second, the desire to solve the problems of water logging and saline deposit will encourage the adoption of more efficient patterns of water utilization and new water-saving irrigation techniques and technologies.
- Third, the ability of Iraq to transfer the Tigris water to relieve any contingent shortage in the Euphrates is a comforting alternative.
- Fourth, consultations are continuing among the riparian states in the Joint Technical Committees, reflects a cooperative trends among the three riparian states.
- Last but not least, as a result of the UN Convention on the Law of the Non-navigational uses of International Watercourses, the parties have recognized that they have to shift their water disputes from contests of power to considerations of fair rights and mutual obligations.

These considerations effectively undermine the likelihood of military conflict between Turkey, Iraq, and Syria over water issues and nullify the fanciful scenarios of water war in this basin posed by many writers such as Chesonoff (1988). We must now turn our attention to the Arabian Peninsula, in which hydro politics has a very different setting, not least because the scarcity of water is a major fact of life.

Despite the failure in resolving the disputes among the co-riparian states in the Joint Technical Committee talks and rejection of the Three Staged plan by the downstream riparian states in the past, the developments in the last decade opened a new phase in the hydro political relations among the co-riparian states. When observing the course of events since the beginning of 2000s, it can be easily argued that cooperative efforts in resolving difference over water issues are more likely than previous decades. Increasing political, economic, cultural and social relations could create a certain level of interdependence among the co-riparian of the Euphrates-Tigris basin. Once this happens, the cost of deteriorating those relations would be high.

Lastly, sustainability measures at the local and national levels should be directed towards achieving overall sustainability at the basin level. In order to realize this, activities at all levels need to be coordinated and directed towards providing cooperation on the sustainable water resource management and achieving sustainable peace in the Euphrates-Tigris Basin.

Chapter-V

The Nile River Basin

(A). INTRODUCTION

The Nile is the birth place of hydrology; no river provides such a wealth of information. Available records reach back to before 3000 BC. They heavy dependence of Egyptian Civilization on the siz of Nile floods, leading to years of famine or plenty, and the ability of Egyptian dynasty society to record evidence for posterity provides a unique opportunity to investigate historical river flows (Howell & Allan, 1994: 26-27).

The Nile has fascinated philosophers, geographers, historians, engineers and politicians of all reeds and races over many centuries, since man first set eyes on its waters. Four thousand years ago three major civilizations flourished the Egyptians is the Nile Valley; the Sumerians in Mesopotamia, the Harappans in the Indus Valley. The emergence of the sophisticated Egyptian civilization at the threshold of history with its unique dependence on the rich annual flood from on unknown source has mesmerized scholars through the ages. Heradatus, "the father of history" in 450 BC described Egypt as acquired country a gift of the Nile River in 4000). *Greek Philosophers*, were so intrigued with the Nile that they believed its origin was not like that of other rivers but it had been created along with the world (Howell & Allan, 1990: 27-28).

The River Nile is a natural system which moves water and rift from mountains upstream locations to particularly extensive and low-lying downstream tracts, on the way serving many peoples and economies. For the past six or more millennia it has been the unreliability of the flow of water which has been the preoccupying issue for the Nile water using communities.

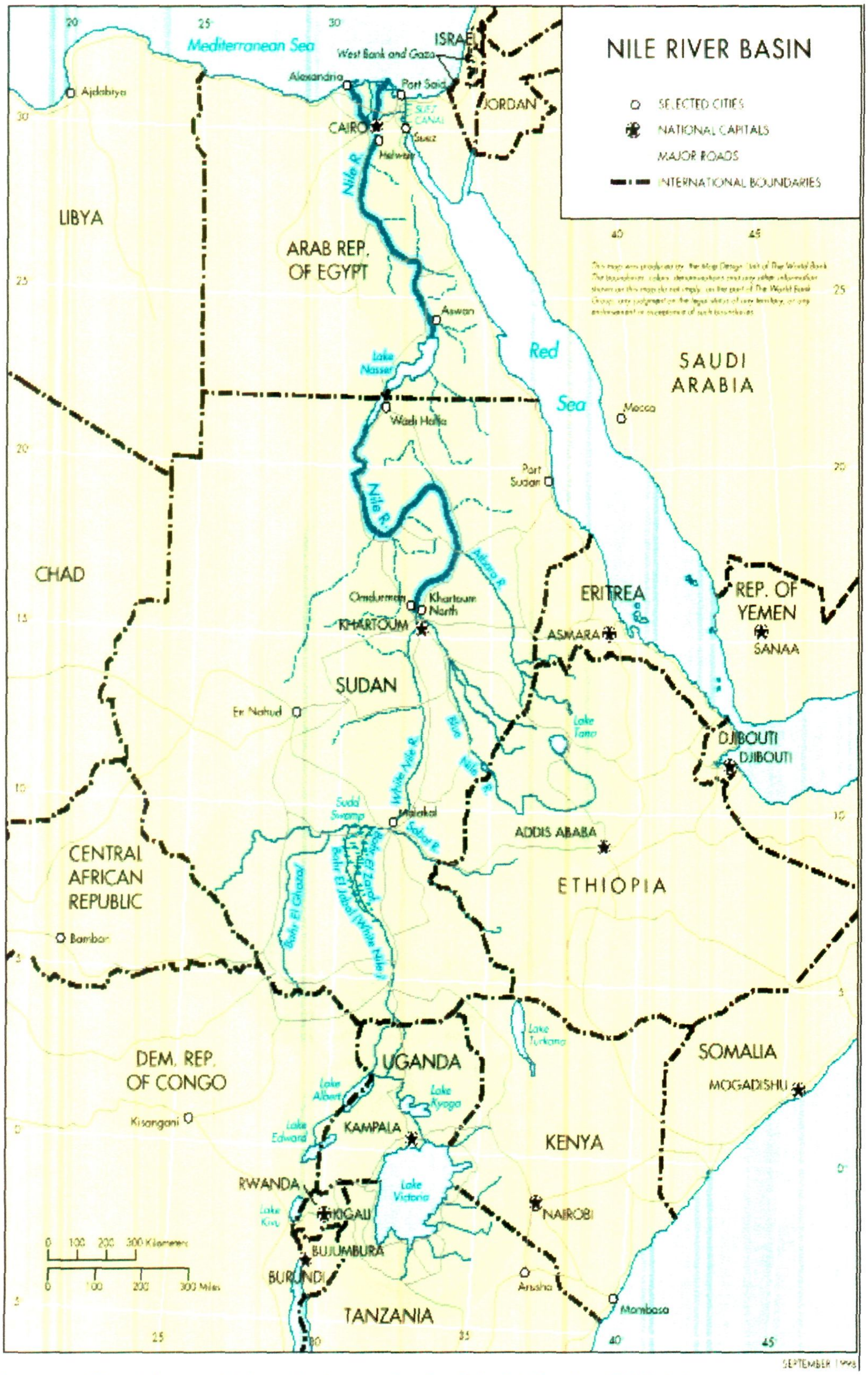
The Nile is a long river, by some meaevres the longest in the world. But it is comparatively not a big river in terms of the volume of water which it shifts each year from the humid uplands of east Africa and the storm of Africa to the Mediterranean. The Nile is significant not because of its length and capacity but because it is aligned south to north and therefore crosses a number of climatic, and climatic related vegetation zones. For millennia it has provided lively hood for millions of people. In the past, and until recent industrialization, over ninety percent of the inhabitants of Egypt depended directly on the waters of the rivers, and without the river Egypt would have been as empty as the rest of the desert (Shapland, 1997: 3).

The Nile has provided the basis of agricultural development in Egypt and the Sudan since the start of agricultural in the area about 7000 years ago. Artificial irrigation began about 5000 years ago and continued largely unchanged until the early years of the 19th century when use of Nile water on a significant scale started. The enormous storage provided by the Aswan High Dam enables the variations of the Nile flows from year to year to be evened out and the potential of the Nile to be utilized. Egypt and the Sudan are now, however, faced with the prospect of continuing population increase but with only limited further Nile water available for agricultural expansion (Soffer, 1999: 31).

The Nile includes all or parts of the territories of ten sovereign nation states. The allocation of its waters and the management of them between the competing national and using interests are inevitably complicated and tend to be highly charged with respect to water rights, and the resulting tension are likely to become of greater significance in future. In addition, as some countries develop and their economies grow, they are putting or plan to put new demands on water through the development of irrigation and hydroelectric projects. In response, the more developed countries in the region, which have used Nile waters for years with little competition, are becoming defensive of their water interests for fear that eventually there may be shortfall (Collils, 1990: 198-205).

The present international relation and the pattern of water resource allocation and management are determined partly by the status that is the

NILE RIVER BASIN



Source : Graphics and Map design unit, the World Bank, 2008, May volume and quality, of the water resource, and partly by the predictable attitudes of governments and people to an annually varying resource, the ownership of which is not clear. Because the Nile is a resource shared by ten states, the Nile can only be protected if all ten states cooperate on its management. The existing legal frame work of the Nile, however, is an inadequate basis for dealing with the current problems and does not reflect the needs and interests of all ten Nile riparian states. Egypt and the Sudan concluded an agreement governing the use of Nile waters after independence from Great Britain, but it is outdated and does not reflect the needs and interests of other Nile states. Most of the other Nile agreements are also bilateral, and all have questionable effect today because they were adopted in the Colonial Period. Thus, there is no post-independence agreement reflecting the interests of all Nile riparian states. The present chapter deals with this context. It analyzes the water crisis in the sub region covered by the Nile River Basin and its surrounding areas and examines the role water plays in the historical conflict among Egypt, Sudan and Ethiopia. Special emphasis will be given to the recent cooperation and capacity-Building (Adelphy 273, 1993: 47-49).

(B). HYDROLOGICAL FEATURES OF THE NILE RIVER BASIN

The Nile is an important West Asian river although all its waters come from tropical equatorial Africa. The provenance of the water means that an understanding of the past, current and future water resources of Egypt and the northern Sudan require that the hydrology of the southern, water generating part of the system. The Nile is the longest river in the world, has shaped the culture of Egypt over the millennia. By the time its major tributaries join at Khartoum the flow is about 84 cubic kilometers per year (Allan, 1983a: 472). The Nile River is 6,825 kilometer long over 35 degrees of latitude until it reaches the Mediterranean and its catchments basin covers over three million cubic kilometer. Although the Nile is the longest river in the world, it carries only one thirty-fifth the volume of the

Amazon, the second longest river in the world (Shapland, 1997: 56-57). The parts of these riparian states lying within the Nile catchments cover approximately 12 percent of the African continent. The tropical and equatorial south of the catchments comprises over 50 per cent of the catchments, including the water-tower of the Ethiopian highlands. The humid segment of the catchments enjoys average annual precipitation of over 1000 mm per year. The arid half of the basin receives no useful rainfall as potential evaporation ranges from two to three meters depth per year. The Africa the environmental and economic effectiveness of rainfall is low because potential evaporation and transpiration rates are high at over two meters depth per year. All these environmental factors conspire to make the Nile a long but low water volume river (Allan, 1983a: 472). Its basin embraces some 3,100,000 cubic kilometer of equatorial and northeast Africa. It flows through every natural formation from towering mountains and well-watered highlands of the most barren of deserts (Howell & Allan, 1990: 154). The Nile is an "exotic river" because it receives no tributary inflow or significant rainfall for the last 3,000 kilometer before it flows into the Mediterranean Sea (Joseph, 1997: 121-124). The Nile flows out from lakes on its two main branches. The greater, but shorter, Blue Nile flows out from Lake Tana in Ethiopia, over the Tisisat Falls, while the lesser, but longer, White Nile spills out of Lake Victoria over the Ripon Falls, its shores shared by Kenya, Tanzania and Ugnda. These two rivers unite at Khartoum in the Sudan, and flow as the main Nile to Egypt and the Mediterranean Sea (Colling, 2002: 154).

Table No-5.1
Features of the Nile watershed

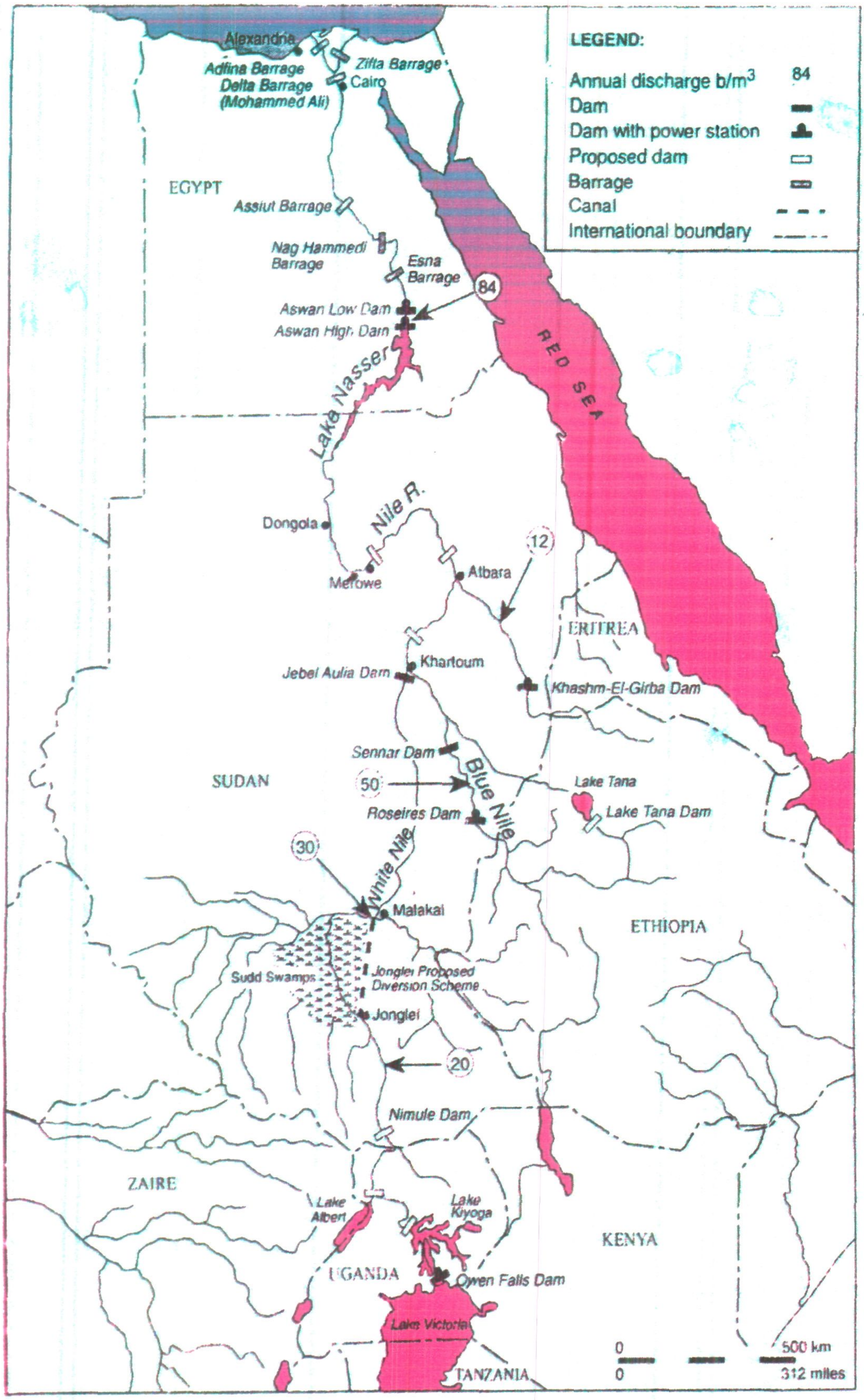
Name	Riparian states(With % of national available water being utilized) b a	Riparian relations (with dates of most recent agreements)	Watershed features a		
			Average annual flow (km 3 /yr.) c	Size (km 2)	Climate
Nile	Burundi (3.1), Congo, Democratic Rebublic of (Kinshasa), Egypt (111.5), Egypt , administered by Sudan (n/a), Eritrea (n/a), Ethiopia (7.5), Kenya (8.1), Rwanda (2.6), Sudan (37.3), Sudan, administered by Egypt, Tanzania, United Republic of (1.3), Uganda (0.6)	Cold to warm (1959 Nile Water Agreement only includes Egypt and Sudan)	84	3,038,100	Dry to tropical

Source: TFDD, 2007
htt://www.transboundarywater.orst.edu/
a Values for lakes under "Annual Flow" are for storage volumes.
b Source: Kulshreshtha (1993) created in January 1993.
c Sources: Gleick ed. (1993); UN Register of International Rivers (1978).
Remaining data from TFDD, 2007.

The Nile and its tributaries bring to gather ten riparian states: Burundi, the Democratic Republic of the Congo, Egypt, Eritera, Ethiopia, Kenya, the Sudan, Rawanda, Tanzania and Uganda (Majtenyi, 2004: 18). The Nile River, run through much of Africa, yet 36 percent of Africa's population lacks access to clean drinking water (Hobbs, 2004: 15).

The Southern states are part of the Nile system because their rivers drain into equatorial lakes that feed the Nile. Fox example, the Kagera River in Rwanda and Burundi drains into Lake Victoria. A number of rivers in Tanzania and Kenya also flow into Lake Victoria. The only outlet of Lake Victoria is the Owen Falls Dam. From Lake Victoria, the White Nile flows through Lake Kyoga to Lake Albert, where it is supplemented by the waters

WATER PROJECT IN THE NILE BASIN



Source : Shapland, 1997: 104

of the Semliki River from the Democratic Republic of the Congo. The flow of the White Nile, also called the Bahr el-Jeble after leaving the lakes region, is significantly reduced by evaporation and transpiration in the southern Sudan due to the vast marshes of the Sudd region (Howell & Allan, 1994: 15-65). After the White Nile passes the Sudd region, the Sobat River from Ethiopia joins the White Nile in the Sudan. From the northwest the, Blue Nile from Lake Tana in Ethiopia, through the Sudan, into the White Nile at Khartoum. The Atbara River from Ethiopia flows through the Sudan to the main Nile. After the Atbara River, no other rivers join the Nile (Shapland, 1997: 10).

The flow of the Nile is highly variable from season to season and from year to year, and thus the contribution of Nile branches, tributaries, and states varies considerably. The Blue Nile has a much smaller basin than the White Nile but it contributes more to Nile flow than the White Nile. On average, 59 percent of the Nile flow is from the Blue Nile, 28 percent from the White Nile, and 13 percent from the Atbara River (Shapland, 1997: 59). 14 percent of the White Nile flow in from the upper Nile states and the other 14 percent is from the Sobat River (Abu-Zeid & Biswas ed.al., 1996: 67).

The Blue Nile's contribution is the largest but is seasonal. Most of the flow comes in August, September and October, just after the monsoon season in the Ethiopian highlands. At those times the Blue Nile may account for up to 90 percent of Nile flow, where as in July, just prior to the wet season, it may account for a little as 20 percent of the main flow of the Nile. The White Nile's contribution, on the other hand, is small but steady. The contribution to Nile flow also varies considerably among countries Ethiopia contributes 86 percent of Nile flow, whereas Egypt contributes nothing. The upper White Nile states contribute a total of 14 percent of water (Shapland, 1997: 59-60).

Table No—5.2
Rate of Population Growth of major users of Nile Waters in the Basin Region.

Country	Population Growth (in %)	Population 2007 (millions)	Projected Population 2025 (millions)	GNP per capita 2006 est. (purchasing power)	Per capita water availability 1990 (cubic meters)	Per capita water availability 2025 (cubic meters)
Egypt	1.7%	80.3	109.2	4,200	1,123	630
Sudan	2.1%	39.3	56.9	2,300	4,792	1,993
Ethiopia	2.8%	76.5	114.6	1,000	2,207	842
Uganda	3.6%	30.2	56.8	1,800	3,759	1,437
Total		**226**	**338**			

Source: TFDD, 2007
http://www.transboundarywaters.orst.edu/ s

While climate change and pollution are bound to have some effect on the availability of fresh water in the Nile Basin, "the greatest single pressure has been caused by the very rapid growth of population" (Topkaya, 1 May 2007: 18-29).

In the next 18 years the population of these four countries is expected to grow by nearly 50%. Although the population growth rate is lower than in the other countries, Egypt has a positive immigration rate, presumably because of its stable economic growth and high per capita income. Of these four countries Egypt is also projected to have the lowest per capita water availability in 2025, (Chatteri et al., 2002: 146) nearly half of what it had in 1990. The other countries will not fair any better, as they continue to draw from the same limited natural resource. A shift in weather patterns, due to climate change or other atmospheric disturbances, may either have a slowing or accelerating effect on the use and availability of water, but it is unlikely to change the trend's momentum (Gleick, 1993: 153).

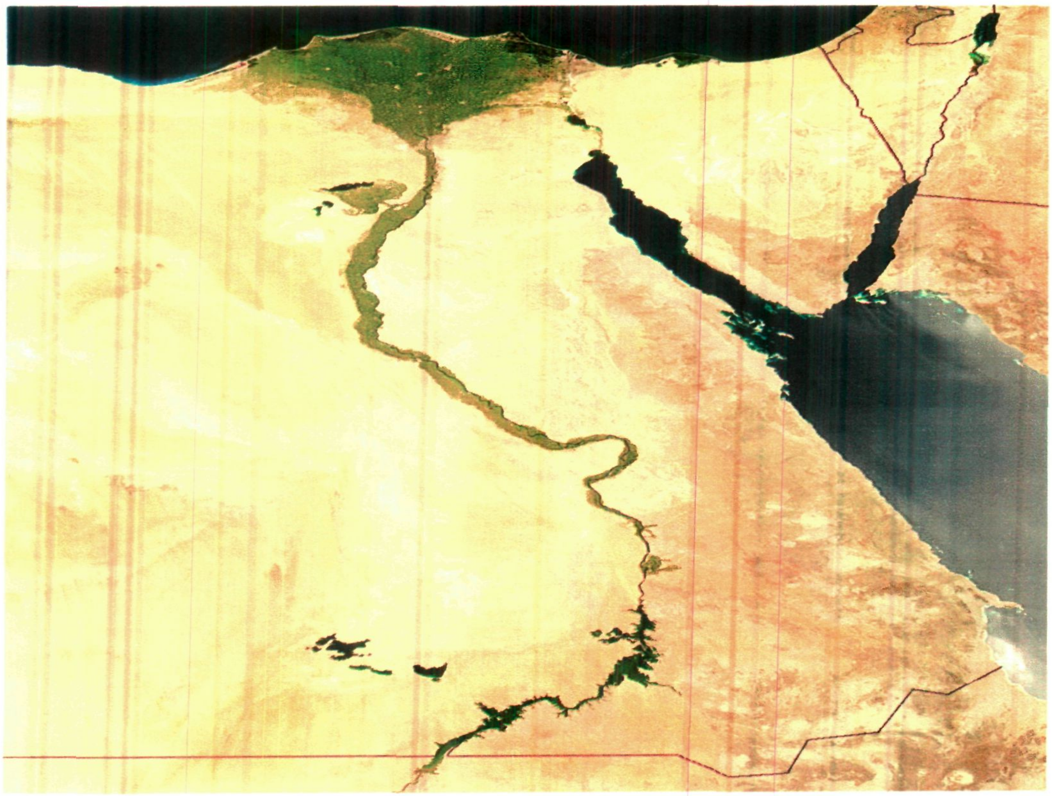


Photo-3: Nile Delta

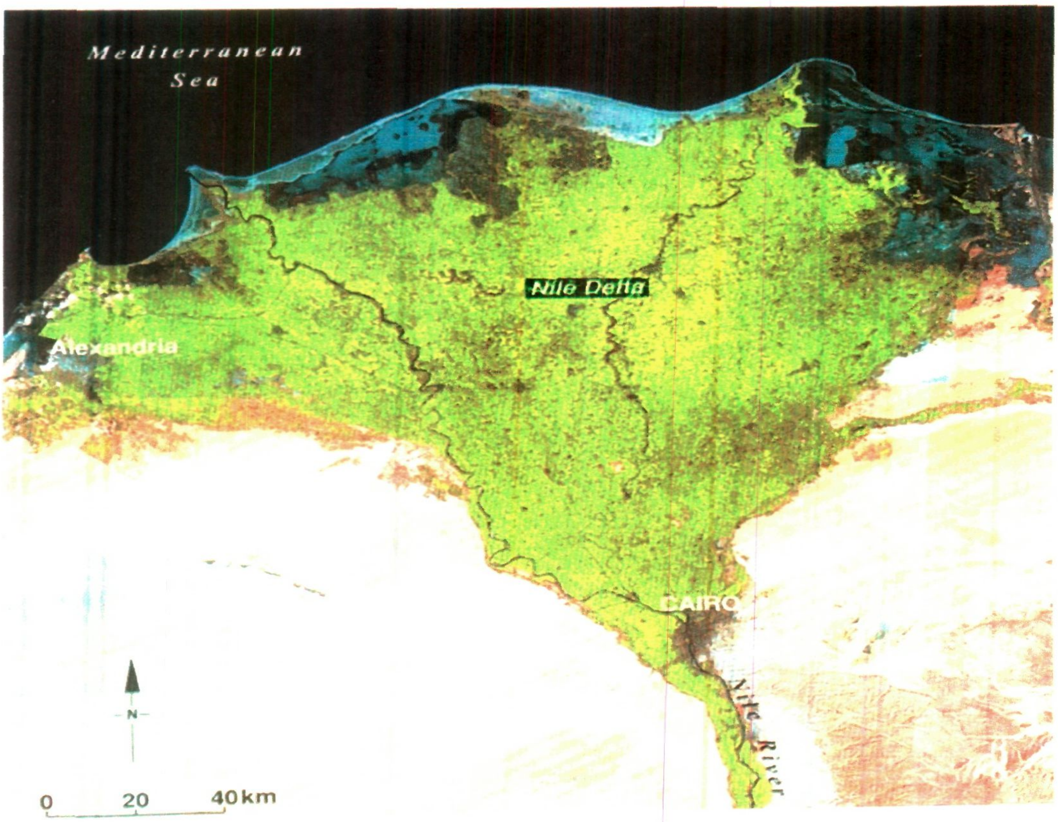


Photo-4: Nile Delta

Photo-1: Aswan High Dam

Photo-2: Hydroelectric generator at Aswan High Dam on the Nile River

Domestic water use, such as for drinking, food preparation cleaning, laundry, and hospitality services, accounts for only a small portion of water compared to agriculture in industry. Due to rising population and economic development, however, domestic requirements are swelling. In the Nile Basin today, population has risen to over 246 million and studies project an estimate of 800 million in 2050 (Hamilton, 1997: 6). Percapita water use also doubled during that time as standards of living raised, global demand for freshwater consequently quadrupled in 50 years (LeRoy, 1995: 15-303).

A desert-type climate exists over most of the remainder of the area north to the Mediterranean. The principal characteristics of the northern Sudan and the desert of Egypt are aridity, a dry atmosphere, and a considerable seasonal, as well as diurnal, temperature range in Upper Egypt. Temperatures often exceed 38^0C, in Aswan, for example, the average daily maximum in June is 47^0C. While no low temperatures are recorded anywhere in Sudan or Egypt, winter temperature decrease to the north. Thus only Egypt has what could be called a winter season, which occurs from November to March when the daily maximum temperature in Cairo is 20^0C to 24^0C and the night minimum is about 10^0C. The rainfall in Egypt is of Mediterranean origin and falls mostly in the winter, with the amount decreasing toward the south. From 203 mm on the coast, it falls gradually to a little over 3 mm in Cairo and to less than 3mm in Upper Egypt. During the spring, from March to June, depressions form the Sahara or along the coast travel east, causing dry southerly winds, which sometimes results in a condition called "Khamsin" (FAO, 1997: 4). Over the years Egypt has taken its full share of 55.5 billion cubic meters and sometimes a little more, whereas the Sudan has never got within 5 billion cubic meter of its allocation. By far the best land for irrigated agriculture is in the Delta. It has the added benefit that it enjoys a milder climate than other areas of Egypt. This means the evapotranspiration is lower and thus more crop per unit of water grown (Stoner, 1994: 2-3).

Rainfall varies from a high in excess of 2,000 mm a year in the headwaters of the Sobat in Southern Ethiopia, to a low of 10 mm around Aswan in Egypt. In the Equatorial Plateau, it is around 1200 mm, dropping to around 1000 mm over the vast tracts of southern Sudan. Potential evapotranspiration is at a maximum of over 2,500 mm just south of Aswan, falling to below 1500 mm in the Ethiopian Highlands and the Equatorial Plateau, a measure of the excess of run-off over the moisture deficit, the difference between potential and actual evapotranspiration on an annual basis. There is a very small region of surplus in the headwaters of the Semliki. Over the Ethiopian Highlands and Equatorial Plateau it is generally around 500 mm, and rises to 2,500 mm around Aswan (Shalm, 1985; Said 1993; Sutelitte & Parks, 1999).

Table No-5.3
Principles for Water Allocation in the Nile Basin

Country	Country share in area of Nile basin(%)	Country water contribution on to the Nile	Climate	Past present utilization	Social and economic needs	Level of dependence on agriculture	Availability of other resources	Treaties and legal agreements concerning the basin	Notes and evaluation
Egypt	62.5	None	Less than 200mm (total desert)	79%[a]; historical right 59-60 billionm^3 (presenr)	Income 630 pop. growth 1.9 Agric. growth 2.7 L.exp.61.6 Inf. mor.57	Food imports 31% Agric. In GDP 17%	Oil, Suez Canal Industry	1959 Treaty with Sudan; Owen Falls with Uganda	Middleincome ecomomicy Lowermiddle income
Sudan	12.1	1%?	Desert 50% savannah 400-1, 500mm 50%	20%[a]; 16 billion m^3 (Present)	Income 540 pop. growth 2.8 Agric. growth 0.8 L.exp.51.8 Inf. mor. 99	Food imports 18% Agric. In GDP 37%	Oil	1959 Treaty with Egypt	Low-income economy
Ethiopia	9.9	84%[a] 72 billion m^3	Tropical 60% highland 80%; semi-arid desert 12%	0.5% less than 0.6 billion m^3 (present)	Income 120 pop. growth 2.9 Agric. growth - 2.1L.exp.47.0 Inf. mor. 122	Food imports 17% Agric. In GDP 41%	Gas, hydropower	–	Low-income economy

Sources: Nurit Kliot, 1994: 75

Note: [a]Egypt and Sudan use about 60 percent of the total flow of the lower Nile system. The other 40 percent of water is only available for economic use to a minor extent (Allan, 1990: 183).

[B]the total contribution of the six countries is 14-16 percent of main Nile discharge (Badr 1959: 94-95; Waterbury, 1979: 23). According to Okidi (1990:195), Ethiopia's water contribution to the Nile's discharge north of Khartoum is 75-80 percent while the Equatorial Lakes contribute between 20 and 25 percent. According to Waterbury, Ethiopia contributes 86 percent of the waters to the Nile, where as Badr puts it 84 per cent.

(C). GEOPOLITICAL DEVELOPMENT IN THE NILE RIVER BASIN

In the Colonial Period, Great Britain effectively controlled the entire Nile through its military dominance in Africa and its political control of Egypt, the Sudan and the three upper riparian states on the White Nile. Colonial-era treaties ensured that no projects could be built in the Nile Basin, and that no upstream Nile water could be withdrawn without Egyptian and British consent control over the Nile was an essential part of British Colonial strategy. This control was also the key to Egypt's own viability, because Egypt, despite its military power, is vulnerable due to its heavy reliance on the Nile for water and position as a lower riparian (Elhance, 1999: 68-105).

Colonial-era tensions carried over into the post Colonial period creating a regime in the Nile basin that was, until recently, properly characterized as one of open conflict. Remnants of Colonial era agreements compound the problems presented by already existing asymmetries in information, gaps in science and uncertainty about technical matters, ineffective means of enforcement, claims of sovereignty and superior rights, domestic and international conflicts in interest, and the upstream-downstream dynamic (Richard & Netanyahu, 1998: 1-9).

Tension over the Nile started in Colonial time when nations with Colonial representation (Sudan and Egypt) were able to exploit resources of the other Basin Nations. At the beginning of the twentieth century, a world cotton shortage led Egypt (under British rule) to focus on producing cotton, which requires constant irrigation and high level of water (Kimberly, June 2002: 23-28).

The two principal elements determine the geopolitical development in the Nile basin are "International agreements of the water management in the basin and" the complex relationship among the basin states. The nature of the development is determined by Egypt's dominance concerning discharge water exploitation, the Colonial history of the basin states and the political instability in most of these states. Most of the agreements among the Nile Basin states were signed in the Colonial Period at the initiative or under the influence of the Colonial powers. The governance of the Nile water resources based on Colonially-imposed agreements is now becoming increasingly outdated (Waterbury, 1992: 49).

So far as cooperative solution are concern, the Nile basin with its ten riparian states and gross contrast in degrees of dependence upon the Nile among them, is a nightmare. Most of the agreements regarding the allocations of the Nile river water were completed to protect the interests of only two of the riparian countries Egypt and the Sudan (Shapland, 1997: 69).

(D). INTERNATIONAL AGREEMENTS ON THE NILE WATER UTILIZATION

Most of the agreements among the Nile basin states were signed in the Colonial period at the initiative or under the influence of the Colonial states. Britain which played a dominant part in these agreements protected first and foremost Egypt's interest and later Sudan's. The agreements do not deal with the development of the use of the Nile water, but rather with preventing the other riparian states from using it. The other Colonial powers that singed these agreements such as Italy, France, Belgium, did not protect the interests of the lands under there rule. Therefore these Colonies suffered under their rules especially Ethiopia, whose natural rights to use Nile water were ignored by the then Colonial power (Laudicina, 2007: 241).

During the Colonial era Great Britain was the dominant power in the region, and controlled the major part of the basin of the Nile and the White Nile. The Ethiopian highlands, however, with the sources of the Blue Nile, were outside British control (Laudicina, 2007: 241). Britain sought to secure the interrupted flow of water from the Ethiopian highlands by signing agreements with Ethiopia or with Italy. In 1891 Britain and Italy negotiated a protocol for the demarcation or their respective sphere of influence in Eastern Africa. Article III of the protocol established that the government of Italy not to do any thing that would impede the flow of the Atbara, or to construct other works which might effectively modify its flow into the Nile (Okdid, 1994: 102-195).

In 1902 Ethiopia Italy and Britain (acting for Egypt and the Sudan) signed a bilateral agreement known Agreement Addis Ethiopia undertook to seek the anent of Britain before initiation any works that might affect the flow of Blue Nile or Sobat River (Shapland, 1997: 70).

In 1906 the independence state of Congo which was controlled by Belgium also agreed not to change the flow of the Semliki and Isangi Rivers into Lake Albert without the consent of Britain and the Sudan (Okidi, 1994: 198).

In 1920 the Nile Project Commission was formed to asses the requirement of lower riparian states. The Commission estimated the Egyptian needs as 58 billion cubic meters per year out of his average fall of 84 billion cubic meters per year. The Sudan it was thought could be able to meet aggregation needs from the Blue Nile alone. In 1925 new water commissions made recommendations based on the 1920 estimate which would finally laid to the Nile Waters Agreement between Egypt and the Sudan on 7 May 1929. This agreement allocated 4 billion cubic meters per year to the Sudan and a total annual amount of 48 billion cubic meters per year was reserved for Egypt. Thus Egypt gained overwhelming water rights in the 19029 Agreement and also received control of hydrological studies of the Nile (Abu Zeid, 1992: 46). Egypt however viewed the 1929 agreement as temporary because the political future of the Sudan had not yet been decided (Okidi, 1994: 327). After the abolition of the protectorate in 1922, Egyptian governments repeatedly asserted their aspirations concerning the Sudan.

From that time on wards the Sudan and the use of the Nile waters emerged as a serious issue in Anglo-Egyptian relations (Collins, 1990: 148f).

The water sharing conflict has in the past been associated with a number of difficulties in relations between Egypt and the Sudan countries. It is important to note that Egypt's and the Sudan have not always been quite separate countries with complete separate legal identities. Originally part of the Turkish Empire, Egypt was occupied by Britain in 1882. In 1883, however, the Mahdi set up a state in the Sudan provinces until, in 1896-99, Joint Anglo-Egyptian military operations reconquered the provinces. In 1899 an agreement between the British Government and the Khedive of Egypt created the Anglo-Egyptian the Sudan. In reality this was a condominium in which Britain and Egypt had joint sovereignty. Whereas Egyptian independence was recognized quite soon, in 1922, the Sudan did not achieve its own independence until 1956 (Brownlie, 1979: 54-64).

The potential vulnerability of Egypt supply of Nile water has pre occupied its rulers for centuries. Indeed, according to legend, the Sultans of Egypt sent emissaries to Ethiopia with tribute, to persuade the emperor to allow the Blue Nile to continue to flow (Collins, 1990: 1-6).

In a 1925 exchange of notes between Italy and Britain, Italy acknowledged the Sudan's and Egypt's "prior hydraulic rights, and thus agreed not to begin any projects on the Blue or White Niles or their tributaries which would modify the flow of the river (Carroll, 2000: 277). After the First World War, Egypt recognized the need to create a formal agreement on water allocation before further advancing any regional development plans (Lee, 2007: 241).

The 1929 agreement Appendix between Egypt and the Sudan enshrined Egypt's acquired rights to 48 billion cubic meter of water, sufficient to irrigate 2.19 million hectares of land. At the same time, the Sudan was guaranteed 4 billion cubic meters in recognition of its future needs. Thus the 1929 treaty embodied both of the fundamental claims mentioned above. It could do so because the system contained so much water some 84 billion cubic meters on average allowing the Sudan, as the upstream state, to build the Sennar Dam in order to capture its share without threatening Egypt's rights. Because at that time all storage facilities were seasonal in nature, the real issue was not water per se, but rather timely water, i.e., the water Egypt needed in the summer months for its cotton, sugar cane, and eventually rice harvests. The 1929 treaty Guaranteed Egypt's exclusive rights to the summer flow of the main Nile, and to enhance it, Egypt undertook construction of the Jebel Aulia Dam. The Sudan, by contrast, had to cultivate its cotton during the winter months (Waterbury, 1979: 63-115).

Although the Nile Waters Agreement reached in 1929 consisted only of an exchange of notes between the British High Commission in Cairo and the Egyptian Government, it provided for the regulation of the river until the Nile waters Agreement of 1959. The detailed 1929 arrangements 'appeared to work solely for the benefit of Egypt established its historic rights over the use of the Nile water were recognized (Collins, 1990: 157).

This was a *Landmark* agreement, not only for the West Asia but for the world. It fixed quantitative shares in an International River. Its significance may have been obscured by the fact that Egypt was a sovereign state in only a narrow legal sense, and Great Britain negotiated the treaty on behalf of the Sudan. Nonetheless, this treaty sought to operationally the concept of fair and equitable use before the term was invented (Waterbury 1979: 65-114; Collins, 1990: 198-246).

Although one of the stated purposes of the agreement was to mobilize upstream developments, they served primarily to protect Egyptian agricultural interests, reserving a minor claim for British Sudan–generally ignoring other upstream riparian states rights. The 1929 agreement granted the vast majority of water allocation to Egypt. Of the Nile's average 84 billion cubic meter per year, over half was reserved for Egypt (48 billion cubic meter per year) and 4 billion cubic per year was allocated to Sudan, leaving only 32 billion cubic meter per year unallocated for the use of upstream riparians, or possibly for subsequent division between Egypt and Sudan. In addition the British government assured the Egyptian representative that the British government, however solicitous for the prosperity of Sudan has no intension of trespassing upon the natural and historic right of Egypt in the water of Nile (Waterbury, 1979: 110-112).

Although the entirety of Nile water flow originates outside of Egyptian borders, from the Lake of Central Africa and the Blue Nile and the Atbara River from Ethiopia, the 1929 Agreements provided that the Sudan water interests would be subordinated to those of Egypt also requiring Egyptian oversight and approval of any irrigation, power, other water divergent project along the Nile. Avaire of its one vulnerable position as the farthest downstream state along to river, Egypt has continued the govern its, use of the Nile waters with the strategy of protecting and enhancing it potential feature claims. Since the enactment of the 1929 agreement Egypt has adhered to a nationalist theory of territorial water rights, according to which all important works on the Nile should be constructed in Egyptian territory in order to avoid the danger of any works build outside of the country being used as a political weapon against Egypt (Caponera, 1993: 653).

5.1: STATUS OF COLONIAL AGREEMENTS

As many of the Nile states became independent in the 1950s and 1960s, the status of their Colonial Agreements came into question. Under the clean slate doctrine of International Law, successor states do not inherit the treaty obligations of their predecessors. A competing school of thought, however, contends that territorial, real, dispositive, or localized treaties pass from predecessor to successor state. While the clean slate doctrine in its absolute sense is not accepted under International Law, it is generally recognized that a newly independent state starts with a clean slate with respect to treaties that do not contain local or real obligations (Fisseha, 1981: 178-179). Thus, under that theory, successor states might continue to be bound by Colonial River treaties.

In determining whether Colonial treaties were binding on them, newly independent states in the Nile region did not cite any particular School of International Law, but developed their own justifications for renouncing Colonial treaties. According to the Nyerere Doctrine of Treaty Succession originally asserted by the first president of Tanganyika (Tanzania) Julius, developed by Tanzania, treaties applying to territories under British Colonial Administration lapsed when the territories became independent (Okidi, 1994: 328-3329). Under this doctrine, the Colonial treaties are not binding on the newly independent states because the new states never took part in the negotiations creating the obligations under the treaties. Thus, Tanzania, Uganda, and Kenya argued that the 1929 exchange of notes lapsed when they became independent in 1961, 1962, and 1963 respectively (Collins, 1990: 122). Egypt, however, maintained that the 1929 exchange of notes remained applicable "pending further agreement".

Ethiopia's view of the Nile Agreements signed by Colonial governments is not clear (Okidi, 1994: 329). Egypt and the Sudan insist that the 1902 treaty among Ethiopia, Britain, and Italy established that Ethiopia may not begin Nile water projects without the consent of Egypt and the Sudan (Dellapenna, 1997: 128). Ethiopia's statements about its water rights in 1956 and 1957, however, indicate that it no longer regards the Colonial Nile Agreements as binding on itself or other successor states (Fisseha, 1981: 189). Ethiopia has questioned the validity of such agreements for a number of reasons (Okidi, 1994: 324). For example, Ethiopia argued that it could denounce the Colonial Nile Agreements, not only under the clean slate doctrine of state succession, but based on the Egyptian and the Sudanese practice of denouncing treaties signed by Britain on their behalf if they no longer reflect their development needs (Dellapenna, 1997: 128). Because Ethiopia received no benefit whatsoever from these Colonial Water Agreements, it could denounce them as inadequately representing its need to develop water resources.

In general, Egypt has maintained that the Colonial Agreements are controlling, but other former Colonies have disagreed with this position. Due to state succession in the region and the change in economic and political circumstances of the Nile states, the status of the Colonial Agreements is unclear (Fisseha, 1981: 187).

(E). EGYPT AND SUDAN CONFLICT OVER THE NILE RIVER BASIN

For the states of the Nile Basin upstream of Egypt and Sudan, shortages of water could act as a constraint on economic development. For Egypt and the Sudan, the situation in different. Both countries already make extensive use of Nile water. Egypt could suffer from higher consumption by Sudan. Egypt is portienterly Nulnerable. It has no significant sources of water apart from the Nile. Are-negotiating of the Agreement to give, Egypt more water in out of the question. In a 1925 exchange of notes between Italy and Britain, Italy acknowledged the Sudan's and Egypt's "prior hydraulic rights, and thus agreed not to begin any projects on the Blue or White Niles or their tributaries which would modify the flow of the river (Carroll, 2000: 277). But the end of First World War, Egypt recognized the need to create a formal agreement on water allocation before further advancing any regional development plans (Lee, 2007: 241).

Egypt acknowledged that it was willing to allocate more water for the Sudanese development, but only insofar as it did not "infringe Egypt's natural and historical rights in the waters of the Nile and its requirements of agricultural extension". The Egyptian government reiterated the requirement of its prior consent of the Sudanese projects along the Nile (Carroll, 2000: 277).

The 1929 agreement between Egypt and the Sudan enshrined Egypt's acquired rights to 48 billion cubic meter of water, sufficient to irrigate 2.19 million hectares of land. At the same time, the Sudan was guaranteed 4 billion cubic meters in recognition of its future needs. Thus the 1929 treaty embodied both of the fundamental claims mentioned above. It could do so because the system contained so much water some 84 billion cubic meters on average allowing the Sudan, as the upstream state, to build the Sennar Dam in order to capture its share without threatening Egypt's rights. Because at that time all storage facilities were seasonal in nature, the real issue was not water per se, but rather timely water, i.e., the water Egypt needed in the summer months for its cotton, sugar cane, and eventually rice harvests. The 1929 treaty guaranteed Egypt exclusive rights to the summer flow of the main Nile, and to enhance it Egypt undertook construction of the Jebel Aulia Dam. The Sudan, by contrast, had to cultivate its cotton during the winter months (Waterbury, 1979: 63-115).

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In 1956 the Republic of the Sudan was inaugurated, and the first prime Minister, Ismail al-Azhari, immediately reiterated that the 1929 Agreement should be revised just when Gamal Abdel Nasser of Egypt was contemplating the creation of a massive new Dam at Aswan. The year 1956-58 witnessed a serious dispute between the two countries over their share of the Nile waters, and Egypt withdrew from a previous undertaking to help the Sudanese to build a reservoir at Roseires on the Blue Nile, because of their continuing objections to the construction of what became known as the Aswan High Dam. Relations deteriorated further when the Sudan declared unilaterally its non-adherence to the 1929 agreement, and during this period of tension, Egyptian army units were moved to the border as a show of force (Gabriel, 1991: 570).

After the military take-over in Khartoum in 1958, the regime headed by General Ibrahim Abboud began to soften its stance towards Cairo and the following year an agreement between the Republic of the Sudan and the United Arab Republic of the Sudan and the United Arab Republic was signed for the full utilization of the Nile waters (Collins, 1990: 406-13).

The deadlock was eventually broken. In 1958, Egypt had received a promise of funding for the High Dam from the Soviet Union-a promise that was not conditional on Sudanese agreements to the project. The Sudanese found themselves in a less favourable position as regards Rpseires: they asked the World Bank for finance but were told in March 1959 that this would only be forthcoming if they were to sign an accord with Egypt (Abdalla, 1971: 67-80).

The other important issue between Egypt and the Sudan arose quite simply and understandably from the fact that the waters of the Nile in Egypt originate far to the south, not only beyond its own orders but also beyond the borders of Sudan with Ethiopia. As the gift of the Nile', utterly dependent on its water, Egypt has perhaps the greatest vested interests in resolving any disputes with its upstream neighbour. Indeed, up to just before the Sudan's independence in 1956 many writers and politicians on both sides of the border argued strongly for some from of unity between the two countries, and it was the mutuality of interests over the Nile waters that initiated and perpetuated such movements for Egyptian-Sudanese unity (Waterbury, 1979: 43).

In November 1958, the Sudanese army took over the government of the country and negotiations between the two governments were quickly resumed. Three committees were set up-for trade, financial matters and the Nile waters. The question of the Nile was therefore now to be linked with trade and financial relations between the two countries- matters of urgent importance to Sudan which had suffered seriously from the disruption of trade and financial relations during its period of dispute with Egypt (Megahed, 1973: 89).

(F). 1959 AGREEMENT BETWEEN EGYPT AND THE SUDAN

After the Sudan independence it sought revisions of the 1929 agreement. In 1958 the Sudan officially repudiated the 1929 the exchange of notes on the grounds that economic and technical development since 1929 had rendered these provisions obsolescent (Fisseha, 1981: 187). In 1959 Egypt and Sudan negotiated the agreement on the full utilization of the Nile waters. It will not be out of contest to briefly explain the signing of the 1959 agreement between Egypt and the Sudan. In the intervening 30 years the needs of Egypt and the Sudan for irrigations waters have grown dramatically. Seasonal storage facilities would not capture enough of the annual flood to meet the increased demands. After the military coup of 1952 Egypt advocated Aswan High Dam as the solution to over year storage. Egypt in fact rejected for a time the century water scheme that had been elaborated by the British and would have played stick storage facilities (Collins, 1990: 205). The Egyptian considered the British plan as a step to deprive her water needs and maximized their vulnerability. The Aswan high Dam was intended to ensure a regular supply of drinking and irrigation water all year-round, during flood and low water season, and every year, whether wet or dry. Egypt needed Sudanese agreement because the vast reservoir to be impounded by the Dam would flood Sudanese territory. Less immediate but more important in the long term was the Egyptian desire to ensure that Sudan would not do any thing that would reduce the flow of the Nile into Egypt to an extent would jeopardize the operation of the High Dam. Negotiations dragged on for a number of years, the principal stumbling block being Sudanese unwilling ness to agree to the High Dam without a substantial increase in the pattny 4 billion cubic meter of Nile water allocated to Sudan by the 1929 agreement. In 1954 which was broken off inconclusively (Collins, 1990: 200-205). The position of the two sides can be summerised as fallow:

5.2: EGYPTIAN POSITION

- Existing needs should take priority. These were described as being 51 billion cubic meter for Egypt and four billion cubic meters for the Sudan, out of average flow of 80 billion cubic meters as measured at Aswan (Waterbury, 1970: 64).
- Any remainder from development projects should divide as a percentage of each country's population after subtracting 10 billion cubic meters for evaporation losses. The respective population and growth rates led to an Egyptian formula for 22/30 of the remainder, or 11 billion cubic meters for Egypt, and 8/30, or four billion cubic meters for the Sudan (Allan1993b: 78).
- There should be one large storage facility, a High Dam at Aswan.
- Total allocations would therefore be 62 billion cubic meters for Egypt and 8 billion cubic meters for the Sudan (TFDD, 2007: 3-19).

5.3: THE SUDANESE POSITION

- Sudan insisted on using the standard value of 84 billion cubic meters for average Nile discharge, and insisted that Egypt's acquired rights were for 48 billion cubic meters, not 51 billion cubic meters that claimed.

- Sudan also suggested that their population was actually 50 percent larger than Egypt had estimated, and that resulting population-based allocations should be adjusted accordingly, giving the Sudan at least one third of any additional water (Knott & Hewett, 1990: 4-74).

- Storage facilities should be smaller and upstream, as envisioned in the Century Storage Scheme. Consequently, if Egypt insisted on one large project, with comparatively high evaporation losses, these losses should be deducted from Egypt's share (TFDD, 2007: 5-21).

- Total allocations, therefore, should be approximately 59 billion cubic meter (69 BCM less evaporation) for Egypt and 15 billion cubic meters for the Sudan. (The Nile Basin Global perspective, (http://butler.cc.tut.fit/-asheesh/nile.htm).

Table No-5.4

Water Allocations from Nile Negotiations.

Position	Egypt (BCM/year)	Sudan (BCM/year)
Egyptian	62.0	8.0
Sudanese	59.0	15.0
Nile Water treaty (1959)	55.5	18.5

Source: Transboundary Freshwater Dispute Database (TFDD, 2007)

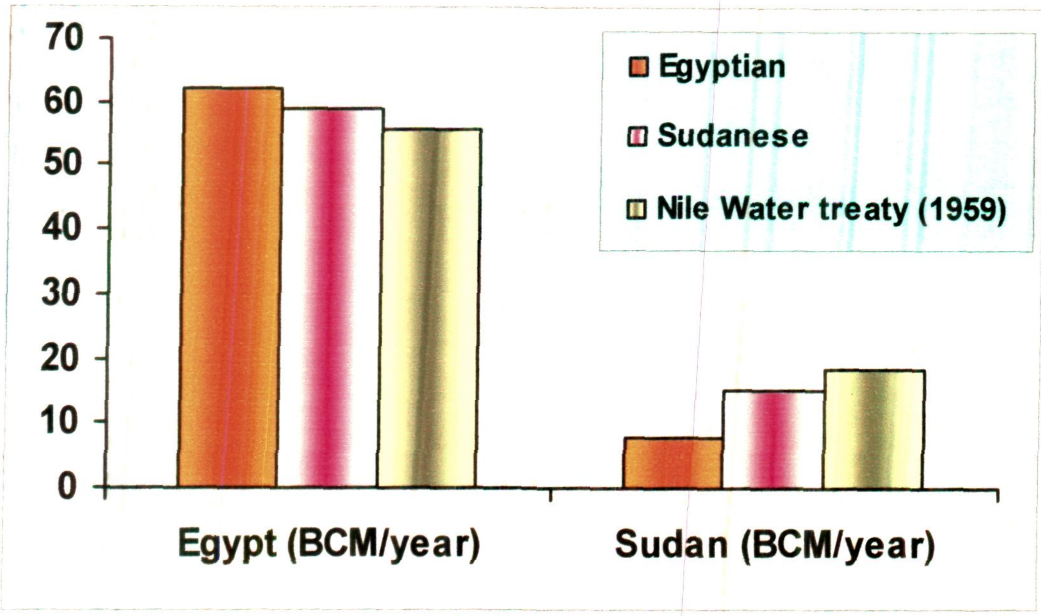
http://www.transbpundarywaters.orst.edu/

1 The Egyptian position assumed an average flow of 80 billion cubic meters per year and divided approximately 10 billion cubic meters per year in evaporation losses equally.

2 The Sudanese position assumed an average flow of 84 billion cubic meters per year and deducted evaporation from the Egyptian allocations.

3 The Treaty allowed for an average flow of 84 billion cubic meters per year and divided evaporation losses equally.

Graph 5.6: Water Allocations from Nile Negotiations.



In April 1955 negotiation against started regarding the revision of 1929 treaty. However due to different positions of negotiating party's nothing could be agreed upon. Relations then threatened to degrade into military conformations in 1958 when Egypt sent an unsuccessful expedition into territory in disputes between the two countries in the summer of 1959 Sudan unilaterally raised Sennar Dam, affectively repudiating the 1929 agreement. Sudan also wanted to build a Dam at Roseires and needed international finance (Chesworth, 1990: 66-90). But this money was not likely to be forthcoming as long as Egypt raised objections to the project. The World Bank put a condition for singing a accords with Egypt. This was conveyed to the military regime in Sudan in March 1959 (Abdalla, 1971: 1-81). The military regime adopted a more conciliatory tone in the negotiations and finally on 8th November 1959 the agreement of full utilization of the Nile was signed between the Egypt and the Sudan. The following are the main, provisions of the 1959 agreement (Collins, 1990: 54-72).

5.4: PROVISIONS

The Nile Water Treaty had the following provisions:

- The average flow of the river is considered to be 84 billion cubic meter per year. Evaporation and seepage were considered to be 10 billion cubic meter per year, leaving 74 billion cubic meters to be divided.
- Of this total, acquired rights have precedence, and are described as being 48 billion cubic meter for Egypt and 4 billion cubic meters for Sudan. The remaining benefits of approximately 22 billion cubic meter are divided by a ratio of 7/12 for Egypt (approx. 7.5 billion cubic meter per year) and 14 ½ for Sudan (approx. 14.5 billion cubic meter per year). These allocations total 55.5 billion cubic meters per year for Egypt and 18.5 billion cubic meters per year for the Sudan (Mahmoud, 2003: 7-6).
- If the average yield increases from these average figures, the increase would be divided equally. Significant decreases would be taken up by technical committee, described below.
- Since Sudan could not absorb that much water at the time, the treaty also provided for the Sudanese water "loan" to Egypt of 1,500 million cubic meters per year.
- Funding for any project which increases Nile flow (after the High Dam) would be provided evenly, and the resulting additional water would be split evenly.
- A Permanent Joint Technical Committee to resolve disputes and jointly review claims by any other riparian would be established. The Committee would also determine allocations in the event of exceptional low flows.

- Egypt agreed to pay Sudan E$15 million in compensation for flooding and relocations (Mahmoud, 2003: 7-6).

The 1959 agreement was a success in permitting both Egypt and the Sudan to carry out projects that they regarded as vital to their development. The agreement also removed cause of tension that had soured relations between them for most of the 1950s. For Egypt in particular, the agreement provided the benefit of the enhance security of water supply (Collins, 1990: 22). There are two elements which can be considered important to the signing countries. The first was the removal of Sudanese threat in that the maximum volume of water which could Sudan takes was defined. Thus, Egypt has got assurance of sufficient water supply. The second element provably more important was the agreement allowed the High Dam to go ahead. It also allows Egypt to store water on its own territories and there by to have complete control over the timing of it's realized. However Egypt and Sudan ignored the rights of the remaining basins states, the upstream states and they also agreed to cooperate in rejecting any future claims that these states might make (Holell et al., 1998: 46-48). Egypt and the Sudan also agreed to present a unified view in any other negotiations concerning the Nile waters. Egypt also reserved the right to unilaterally begin any the Nile related project without the consent of other riparian nations (Al-Ahram, June 11, 2004: 78).

Although 1929 agreements served as a basis for principles of the Nile water allocations, modern governance of the Nile River Basin has relied primarily on the legal foundations set forth in a formal 1959 agreement between the Sudan and Egypt, and subsequent adhoc political compromises (Shapland, 1997: 84-85). While 1959 agreement affectively replaced allocations set forth in the 1929 agreements, the agreements together create a comprehensive regime. Of particular important is the fact that the 1929 agreements explicitly bound upstream riparian states, while the 1959 agreement simply polarized there interest with those of Egypt and the Sudan, despite the fact that only the two downstream nations were actually signatories to the treaty (Carroll, 1999: 282). Even today the Nile waters agreements remain as the co-legal basis for International the Nile Water allocation and large scale governess. Allocating the Nile waters the states assumed that the 10 billion cubic meters would be lost due to evaporation from the Lake Nasser and seepage under the Aswan Dam. They agreed to jointly prevent losses of the Nile Basin Waters from the Sudanese Swamps.

Despite the glaring inequities, the other basin nations have adhered to the allocations of the treaty until present date and no other riparian nations have exercise a legal claim to the water distributed under the 1959 tributaries (Hobbs, 15 may, 2004: 13).

5.5: THE ATTITUDES OF OTHER RIPARIAN STATES

The great short coming of the 1959 agreements was that it was signed by only two of the states in the Nile Basins. However the other riparian nations have expressed dissatisfactions with the 1959 agreement (Nkrumah, Al-Arham, 11 June 2004: 32). There is no evidence that Ethiopia, the major contributor to Nile flow was invited to the negotiations of 1959 agreements (Okid, 1994: 333). Egypt and the Sudan estimated that the combined need of all other riparian nations would not exceed one or two billion cubic meter per year. Ethiopia one of the world poorest nations, accounts for more than 75 percent of the water fallowing into the Nile River, but consumed less than 1 percent of the Nile water (Joyce, 16 March, 2004: 18-52). Ethiopia served notice in 1957 that it would pursue unilateral development of the Nile resources within its territories and had announced plans to use the Nile waters for irrigation both within and outside of the Nile water sharing. In renouncing the treaties, Tanzanians Minister of water resources Edward Lowasa, explained it's in equitable underpinnings by saying "the treaties have been entered into without the consent of the people of the region. The British had no mandate to sign treaties with Egypt on our behalf" (Nkrumah, Al-Aharam, 11 June 2004: 67). As outrage spreads through Northern Africa, the east

African press printed editorials chronicling the injustice of the treaty as a Colonial relic (Davin, 13 April 2004: 63). Further since its independence the Kenyan government has stated publicly that it does not recognized the treaty. Uganda also announced its dissatisfactions regarding the allocations of water mentioned in 1959 agreement (All Africa.com, 12 January 2007). Despite such dissatisfactions the treaty has remained intact because Egypt has made it note that it will consider any attempt to violate the treaty as an act of War (Cathy, 18 March, 2004: 15). As an economic military power Egypt is superior to other region's nations among the countries of the region. The Sudan, Ethiopia, Uganda, Burundi, Rwandan have suffered from serious internal crises. Tanzania on the brinks of famine and Kenya in a continually volatile state are also politically unstable. Egypt has had a more stable history which however has not been fully free of conflicts and violence.

Egypt's greater fear over the years has been that Ethiopia might under take development of its western, Blue Nile, watershed without obtaining Egyptians acquiescence. Geography would seem to make such developments inevitable at some times.

In the 1970s and 1980s the upstream states' water requirements grew, and therefore the issue of allocating Nile water arose, as well as the old dispute concerning Colonial accords. In 1977 Ethiopian announced at a UN conference that it intended to utilize the water of the Blue Nile and made similar statements at the end of the 1970s and in 1981 at a UN conference on developing countries. These declarations mentioned the irrigation of 3.8-3.9 million hectares in the Blue Nile basin, as well as several million more hectares in the basins of the Sobat, Akobo, and Umo tributaries (Waterbury, 1979: 78). The equatorial states also stated their intention to utilize the Nile water.

Egypt was caught in a dilemma. On the one hand, it could not ignore the rights of all the riparian states to use the Nile water, and it wished to create a positive image as a cooperative country.

Egypt's response to Ethiopia's statement of intent was therefore twofold. First, it threatened military action: in 1978 president Anwar Sadat said that the Egyptian army would attack any state that seized Egypt's water (Waterbury, 1979: 78). In 1990 Egypt again warned Ethiopia not to utilize the Nile water, and included Israel in its warning, stipulating that Israel should not aid Ethiopia in implementing its plans (Maariv, July 1, 1990: 74). On July 7, 1991, the Egyptian Minister for Irrigation warned that if Ethiopia cooperated with Israel in diverting the Nile waters, Egypt would consider this a Casus Belli. On the other hand, Egypt was prepared to offer Ethiopia 2 billion cubic meter of water during the drought, and to undertake that all waters added to the basin through development projects would be divided among Egypt, the Sudan, and Ethiopia (Shahin, 1986: 32).

(G). THE SUDAN AND ETHOPIA

The Nile water originates on the Ethiopian side of the boundary. One major reason for this must be the tendency to view the Nile Basin a consisting largely of the former British controlled or administered areas notably Egypt, the Sudan and Uganda. 'The Nile still means to many people primarily that part of the Nile which rises on the Lake Plateau of East Africa. However, from the point of view of the Nile water resources, the contribution made by Ethiopia is critical and so, therefore, are the relations between the Sudan and Ethiopia.

In the latter part of the nineteenth century, the ancient Empire of Ethiopia was faced with Egyptian territorial designs along it western frontiers, however imprecisely defined (Abir, 1967: 60). In the last year of the century European Colonial expansion established general areas of influence, leaving Ethiopia with the Italian sphere, are making the extinction of Ethiopia apparently imminent (Brownlie, 1979: 855). For this reason the British, French and Italians made a series of arrangements between 1898-1907 which recognized the existence and territorial integrity of Ethiopia. At this stage, however, the Sudan-Ethiopia boundary was described as the eastern frontier of Egypt, for at that time Britain upheld the rights of Egypt in the Nile Valley, including what is now the Sudan. The Egypt and the Sudan, it was not until later that the Sudan acquired separate status and finally, in 1956, independence as the Republic of the Sudan. The main change to the territory of Ethiopia occurred a few year earlier, in 1952, when Eritrea, formerly an Italian colony, was transferred to Ethiopia by the United Nations (Brownlie, 1979: 856; Hussein, 1977: 29).

The treating is that, based on the 1902 treaty, the boundary was demarcated by Gwynn, a British Boundary Commissioner in 1903 and is still know as the 'Gwynn Line'. Ethiopia and Sudan accepted in a joint Communiqué of 1967, but an agreement of 1972 allows for the rectification of the boundary to eradicate any problems arising in the Baro salient region. The exits from Ethiopia, of the Blue Nile and Sobat Rivers. In the 1902 Agreement III refers specifically to the importance of these water resources: Ethiopia undertook 'not to construct, or allow to be constructed, any work across the Blue Nile, Lake Tana or the Sobat which would arrest the flow of their water into the Nile except in agreement with the governments of Britain and the Sudan (Brownline,1979: 857).

5.6: THE SUDAN AND ETHIOPIAN AGREEMENT OF 1991

At the time of Sudanese independence in 1956, the Ethiopian government set forth its position on the Blue Nile in term reflective of the Harmon Doctrine (Collins, 1990: 71-82), and reiterated that position in 1977 at the Mardel Plata Water Conference (Waterbury, 1982: 78). On December 23 1991, the new Ethiopian government drafted an accord of friendship and peace with the Sudan in which both sides affirmed their commitment to equitable shares in the Nile waters and the avoidance of appreciable harm to one another.

The agreement that Ethiopia and the Sudan signed in 1991 is committing the two countries to the principle of equitable utilization of the waters of the Blue Nile and Atbara Rivers. The two states established a Technical Joint Committee to exchange data and to explore co-operation (Dellapenna, 1997: 132-133). By so doing the Sudan has already moved away from the 'united front binds it with Egypt where the two countries in the 1959 the Nile waters Agreement Committed themselves to act as a 'united front' with regard to the upstream demands for waters. The alliance between the two countries was a serious one to the extent that it has led to the adoption of policies for economic and political integration (Dellapenna, 1997: 132; Collin, 1990). Analysts observe that the Sudan has ides of building an alliance with Ethiopia for mutually benefiting from water; and that this alliance should widen to include the states of east Africa (Owda, 1999: 58).

Ethiopia declared its intention to become a full member in all organizations of the basin states with the objective of establishing a Nile Basin Organization. The two sides agreed to set up a Join Technical Committee for the exchange of data and to explore possible lines of cooperation. While this accord was not caused for alarm to Egypt, the statements of the Ethiopian Prime Minister of May 20, 1993, were. After a visit to Israel, he was quoted as saying that his government had advanced proposals to Egypt for a redistribution of the Nile water. Ethiopia would thus find itself in support of a demand voiced over the years by many the Sudanese (and provided for in the 1959 agreement) that the established allocation be re-negotiated. Any such renegotiation could only come at the expense of part of Egypt's existing share (Auda, 1993: 32).

Given the fact that the Sudan has maintained this' united front' with Egypt for three decades without interruption, despite periods of serious conflict between the two countries, the move could be considered the first significant diversion from the norms that govern the relationship between the two countries over the Nile waters. The conditions that gave rise to this move are harsh enough to jeopardize the historical alliance with Egypt. Observers believe that the major that the major development that has led to this move is the severity of drought and desertification and their repercussions in the Sudan in the 1980s and 1990s (Shapland, 1997: 82).

The agreement that Ethiopia signed with the Sudan appears to concede more to Ethiopia's position, which appeals to equitable entitlement, as the guiding principle in international law of shared rivers. As for Egypt, the Sudan started to, partly, be similar to Ethiopia (the historical source of threat to the Nile flow) in Egypt's image and reaction and a tense atmosphere had taken place (Bleier, 1997: 116).

(H). EGYPT AND ETHIOPIA

5.7 FRAMEWORK FOR GENERAL COOPERATION, JULY, 1993

By the late 1970s the exchange over the Nile between Ethiopia and Egypt were taking place against a background of hostility in other areas. Not only did the two countries have different superpower backers they gave support to each other's regional enemies. Ethiopia had drawn close to Libya, with which Egypt had fought a brief border war in July 1977, while Egypt had supported Somalia during its War with Ethiopia over the Ogaden region in 1977-78.

The Egyptians seem to have feared that, with Soviet help, Ethiopia might use the Blue Nile 'for political ends'. In mid-1978; Sadat threatened strong counter measures, even if this led to war, if any step were taken to alter the course of the Blue Nile (Al-Ahram, 5 October, 1991: 17).

In 1980, Egypt announced its intention to irrigate land in Sinai with Nile water, Ethiopia (probably at Soviet instigation) sent a memorandum to the OAU accusing Egypt of misusing the waters of the Blue Nile and infringing the rights of other riparian states (on the ground that Sinai lay outside the Nile basin). The memorandum reserved Ethiopia's right to use the waters of the Blue Nile on its territory as it wished. Sadat responded with public threats of war, on one occasion advising an audience of army officers to prepare a plan to foil attempt by Ethiopia to impede the flow of the Nile (Guardian, 6 June, 1980: 3).

The case of Egypt highlights the variety of contextual features that help clarify whether, and to what degree, the depletion and /or degradation of a water supply may be considered a national security concern. These features include.

- The quantity and quality of the resource endowment relative to (present and future) consumption demand;
- The nature of resource dependence, that is, whether the state is dependent on one or more sources and whether the source (or sources) is shared, as in a transboundary river and;
- In the case of transboundary Rivers, the number of riparian states involved, the nature of relations with the other riparian states, and finally, geographic position within the basin.

For Egypt, aridity, high population growth, absolute dependence on one, shared body of water, downstream position, and the threat of important extractions upstream coalesce in a perception that water is indeed a security concern: Deleterious changes to the resource would threaten the country's welfare and would invite some centrally coordinated national response. There is, however, an important mitigating condition: Egypt's relative power in the basin, in terms of military force and economic and political power, is superior to the other riparian states, such that the latter are unlikely to engage in actions that could provoke a hostile response downstream (Lowi, 1999: 382).

Ethiopian and Egyptian statements on the division of the waters of the Nile have been less bellicose. President Mubarak, who succeeded Sadat after his assassination in 1981, has not repeated Sadat's threats. However Egyptian Ministers continued to allude to their country's vital interest. In 1985, Boutros-Ghali, then Minister of state for Foreign Affairs, told 'next war in our region will be over the water of the Nile, not politics. In October 1991, General Tantawi, the Minister of Defense, told that Egypt might use force to protect Egypt's supply of Nile water. He made clear, however, that this would be a last resort, should all other means fail: 'We are not ruling out the possibility of using some acts of deterrence after exhausting peaceful means in case any party tries to control the River Nile (Abu-Zeid, 1992: 79). If these statements were intended as a warning to Ethiopia that what Tantawi called 'Egypt's lifeline' could not be interrupted with impunity, it was a rather gentle one compared to Sadat's dramatic threats of over a decade before (Waterbury, 1991: 64-67).

The two sides specified that neither of them would do anything with the Nile that causes 'appreciable harm' to the other. The two countries went further to agreeing to consult and co-operate in projects of mutual advantages such as projects that would enhance the volume of flow and decrease the loss of water through a comprehensive and integrated development schemes (Shapland, 1997: 81).

The agreement between Egypt and Ethiopia "safeguards Egypt's supply of the Nile from Ethiopia by giving prominence to the principle of the avoidance of appreciable harm: the Egyptians would almost certainly argue that any reduction of flow in the Blue Nile caused by works in Ethiopia would constitute such harm. The concomitant gain for Ethiopia is Egyptian cooperation in developing the Blue Nile Basin for Ethiopia's benefit as well as for Egypt's (Shapland, 1997: 81).

A rapprochement between Egypt and Ethiopia had begun after Mengistu's fall. In July 1993, the two states signed a 'Framework for General Cooperation' that included clauses relating to the Nile (Tabbia, 4 August, 1994: 13).

Both the 1991 declaration by Ethiopia and the Sudan and the 1993 agreement between Ethiopia and Egypt were statements of general principles. The former appeared to concede more to Ethiopia's position than the latter, since Ethiopia had for some years argued that the guiding principle of the International Law of shared rivers was that of equitable entitlement. The wording of Ethiopia's agreement with Egypt, in making no explicit mention of equity, still allows the Egyptians to insist that the guiding legal principle should rather be the avoidance of appreciable harm (Tabbia, 4 August, 1994).

In November 1993, Ethiopia reached a similar agreement in principal with Uganda, to the effect that usage of the Nile should be fair. None of these agreements gave any indication of what volume of water Ethiopia might use. The 1959 Agreement between Egypt and the Sudan remains the only accord which makes any apportionment of the waters of the Nile (Shapland, 1997: 82).

Although Egypt is the downstream state in this river system, and utterly dependent upon it, it is also the most powerful economic and military power in the basin. It cannot project that power easily throughout the basin, but no other riparian, including Ethiopia, can afford to ignore it. It is for that reason that Egypt may be described as quasi-hegemony. It cannot impose a solution, but it can coax and threaten its neighbors convincingly (Whittington & McClelland, 1992: 43).

(I). THE NILE BASIN INITIATIVE

Recognizing the need for collective action, the Nile nations took a historic step by establishing the Nile Basin Initiative (NBI) in February 1999. The programe was designed "to achieve sustainable socio-economic development through the equitable utilization of, and benefit from, the common Nile basin water resources" (Nile Basin Initiative, January 28, 2007: 17). The Nile basin Initiative created the Nile Council of Ministers ("Nile-Com"), comprising water ministers from all of the riparian countries, as its highest decision-making body (Davin, April 30, 2004: 15).

The Nile-COM released a statement declaring, we all be lived that by moving together to major joint development, we can look forward to peace and prosperity and not backwards to dispute and conflict. However, the NBI is only a transitional arrangement designed to foster communication until a permanent framework is in place (Nile Basin Initiative, January 28, 2007). While the NBI is a great step toward diplomacy, until a permanent water management program is created, conflict will continue to escalate (Davin, April30, 2004: 13-25).

A final alternative to an entirely renegotiated Nile treaty regime is the NBI, which was established in 1999. After the establishment, the NBI has provided the most promising framework for organization, development, and cooperation across riparian states and was formed by agreement between ministers of all ten the Nile Basin Nations. According to a recent Joint Statement of the Nile Basin Council of Ministers (the organization's chief operating body).

Since 1999, the Nile Basin Initiative has built a temporary the Nile institution, with its Secretariat in Entebbe, Uganda; we have engaged in detailed discussions on a permanent cooperative institutional and legal framework; we have designed a program of eight Shared Vision Projects which bring all Nile countries together, building trust and capacity; and we have begun the preparation of major Joint Development Projects, which involve two or more countries, bringing direct benefits to our people (Nile Basin Initiative, March 18, 2004: 13-23).

The Nile Basin Initiative operates on a broad, "basin-wide" scale, serving as a central coordinating body, attracting investment and implementing large-scale multilateral development projects (Wiebe, 2001: 751). It also aims to establish contact with nation-specific and localized needs and concerns, maintaining a technical coordinating body (the Nile Basin Initiative Technical Advisory Committee) composed of experts delegated by each basin state (Nile Basin Initiative, March 18, 2004: 25).

Although the primary projects of the NBI-the eight Shared Vision Projects-function on a large-scale multinational basis, the organization attempts to decentralize the process as much as possible, providing training and implementation opportunities for basin communities (Nile Basin Initiative, February 15, 2006: 24). While the Nile Basin Initiative provides a significant new basis for coordinating development and attracting investment, however, cooperation, political dialogue, and facilitation can only go so far. In order to provide a stable environment for regional and foreign investors and provide a foundation for resource preservation, dispute avoidance, and conflict resolution, there must be a permanent legal framework in place in the Nile River Basin. While the Nile Basin Initiative provides a model for centralized international governance and decentralized implementation, as well as a sound basis for future negotiation, it is not an end in itself. The Nile Basin Initiative must be used as a starting point for a permanent renegotiated the Nile Waters Agreement—one that incorporates all basin nations, as the NBI has done, and binds all interested parties to a reliable international agreement. The distinct advantage of the Nile Basin Initiative over an open market for water or environment proposals, however, is that it has already organized broad political support and cooperation from all of the Nile Basin nations—an accomplishment that has never before been achieved (Nile Basin Initiative, February 15, 2006: 11-18).

(J). NATURAL AND HISTORICAL RIGHTS CLAIM

A similar approach is that of "natural rights," where a nation could lay claim to international waters on the grounds of hydrology and water catchment contribution, economic and social needs, and principles of "beneficial use" or "reasonable and equitable" distribution (Lake, 1957: 12-111). This approach to transboundary water law, embodied primarily in the International Law Association's Helsinki Rules of 1967, would allow for claims by upstream nations on the basis of flow contribution or need, providing potential support for greatly increased claims by upper Nile riparian states (Helsinki Rules, 1967). In addition, International customary practices may establish a similarly increased right by upper basin nations to the Nile waters. Egypt, however, has historically denied such principles of international customary law or Natural Law claims, arguing instead strictly on the basis of positivist or historical and "prior use" principles (Caponera, 1993: 660).

Historical rights and the "prior use doctrine" have been central to the formation of the Nile water Agreements as well as to subsequent discussion, particularly as the Agreements relate to Egypt's use of the river. According to the prior use doctrine, a nation enjoys the right to waters that have been currently or historically used by that nation (Caponera, 1993: 660). Egypt continues to insist upon this approach, declaring that upstream riparian states are barred from using the Nile waters in a way that limits any established or historical use of the river within Egypt (Wiebe, 2001: 747). The 1959 agreement codifies this approach, explicitly stating that "the amount of the Nile waters used by the United Arab Republic of Egypt until this Agreement is signed shall be her acquired right before obtaining the benefits of the post 1959, Nile Control Project".

The problem with the prior use doctrine in Nile River governance is that there is a significant disparity in developmental capacity between the upper riparian states and Egypt. In additional to Egypt's historical control of the majority of the Nile Basin Resources, it access to the river's flow has compounded the capacity gap: As Egypt gained access to water, it was able to use the resource to increase capacity, which increased access even further. Even the modern example of Egypt's recent desert reclamation projects will likely impact future negotiations because they will expand Egypt's "prior use" of the water (Caponera, 1993: 661-662). In addition, the current trend in international watercourse law supports currently established "prior use" but denies any historical right to waters not presently in use. The Helsinki Rule of 1967 and the 1997 United Nations Watercourse Convention, both nonbinding codifications of International Watercourse Law, adhere to the doctrine of "equitable and reasonable" uses, supporting established "prior uses" of the water, but only as long as such uses are reasonable as balanced against the interests of other basin states (Helsinki Rules, 1967).

The Helsinki Rules state that "an existing reasonable use may continue in operation unless the factors justifying its continuance are outweighed by other factors leading to the conclusion that it be modified or terminated so as to accommodate a competing incompatible use". As such, the prior use doctrine in the Nile River Basin would be tempered by considerations of historical inequity and the potential for more reasonable future distribution among basin states. According to a scholarly critique, "Egypt's insistence upon the legal validity of the principle of acquired and historical rights is not supportable under the current International law of rivers" (Degefu, 11 June, 2004). It must be noted, however, that these agreements—the Helsinki Rules and the watercourse Convention, among others—are generally nonbinding and have been ratified by few nations (Helsinki Rules1 967). Egypt's insistence upon positivist approaches to international law will impact future discussions of these frameworks, and the validity of the nation's historical claims to the river remains in question (Henkin, 1987: 56-60).

(K). CHALLENGES

All countries of the basin have rapidly rising populations and some have problems, periodically extreme, in feeding burgeoning numbers. The demographic element of the food supply problem facing the Nile countries will continue to undermine the attempts of all governments to meet food demands. In the basin the rates of population growth are well above three per cent. The possibility of achieving a significant reduction in the rates of population growth in the next two decades is not high and the consequent economic burden will haunt the political leaderships of the Nile Basin countries (Abate, 1991: 112)

Egypt continues to feed its population but only by regularly importing a substantial proportion of its food staples. The Sudan has sufficient natural resources to feed its numbers but as recent history testifies natural and political events in parts of the vast country, mainly beyond the reach of the Nile water, have devastated food production systems so that emergency food has had to be imported on numerous occasions during the 1970s and the 1980s. The countries which currently use significant volumes of Nile water for agriculture, Egypt and the Sudan, use just over 50 billion cubic meters per year, or about 60 percent of the total flow of the lower Nile system representing a volume close to the maximum utilizable for agricultural production. The other 40 percent of water is only available to a minor extent for economic use.

The conflicting trends of increasing food demand and of reducing water availability for agriculture exacerbate the tension attending the evaluation of downstream water supplies (Smith, 1996: 85).

The agreement reached between Egypt and the Sudan in 1959 was intended to secure Egypt's water for the foreseeable future and at least into the twenty first century in the agreement there was provision both for the security of the flow to Egypt through monitoring arrangements by Egyptian engineers on the Blue Nile and elsewhere, as well as the construction of jointly funded structures such as the Jonglei Canal.

The Sudan on the other hand will be able to increase agricultural production in so far as it will use its remaining 'share' of Nile waters according to its 1959 agreement with Egypt. The Sudan has adequate renewable natural resources to meet its current and future food demands but it will require dramatic changes in its economic and social infrastructures, as well as in its national security, if it is to fulfill its agricultural potential and thereby feed its population.

The extent to which Nile water is essential to securing the future food supplies of the other seven states varies considerably both in scale and imminence. Ethiopia is the country which could use from the Blue Nile alone between six billion cubic meters (US Department of Interior, 1964) and 12 billion cubic meter (Abate, 1991: 112) and while it is currently contemplating using the waters of the river known in the Sudan as the Sobat. The impact of water development in the other states of the basin is negligible, mainly because their withdrawals would take place at points in the catchment south of the Sudd of Sudan. From these marshes the depletion of the Nile water by evaporation and evapotranspiration is the greatest single 'consumer' of water after Egyptian use for agriculture.

The major determinant of the Nile Basin Water balance remains the agricultural sector. The Nile provided the basin of agricultural development in Egypt and the Sudan since the start of agriculture, about 7,000 years ago, and for political reasons, most East African nations have adopted policies of self-sufficiency when dealing with food supplies. The Nile Basin agriculture accounts for at least 80 person of all water consumption. Whereas a few liters of water per data are a basic minimum for human survival, at least a ton per day is required to produce the food needed for a reasonable diet for just one person. There are great losses of water in agriculture because this resource is not uses efficiently (Smith, 1996: 85).

An economic factor which will have a major impact on the rate at which food production on the Nile water will go ahead is the sheer cost of implementing land reclamation. It is impossible to generalize about the true 'economic' cost of reclaiming a hectare of irrigated land throughout the basin as climate and other environmental factors vary so much (Allan, 1983: 247).

The sheer cost of providing the adequate agricultural and social infrastructures requires the investment of well over US$25,000 per hectare on farm investment, suggesting levels of investment of US$ 1000 per hectares. Since countries are talking of reclaiming tracts of more than 500,000 to one million hectares, investments of US$12 bn to US$25 bn are implied. These sums would only cover local minor water distribution systems and on farm investments. In addition there will be substantial civil works to construct and the major engineering infrastructure for regional water distribution. No country of the region can from its own resources service such investment flows (Allan, 1983: 247).

The consequences are numerous in that the problem has its internal and external dimensions. Internally the pressure on scarce investment resources leads to conflict between spending agencies of governments. Choices have to be made between investment in agriculture expansion and other productive sectors as well as between such investment and investment in measures to improve the social infrastructure. Externally the problem is expressed in the relationships of the Nile countries with international agencies and in the myriad of multi-lateral and bilateral government relationships in the world of international assistance. All countries of the Nile Basin receive international aid and are substantial debtor economies owing large sums to or are deeply involved with the World Bank and the International Monetary Fund (Allan, 1983: 247).

Irrigated agriculture also continues to be a major activity in the basin. It is the largest user of the basin's surface water resources and a primary sector of economic growth in the downstream countries, Egypt and the Sudan.

In Egypt, irrigated agriculture is the dominant sector. Over 4 mn ha under irrigation, and there are plans to expand over an area of another 1 mn ha. In the Sudan, the irrigation sub sector contributes 65 per cent of the GNP and extends over an area of 1.5 million ha, with plans to expand over an area of another 1.5 million ha.

The role of the irrigation sub sector diminishes as one move to the upper reaches of the river basin. Present irrigation in the Upper White Nile riparian areas is very limited. In Ethiopia, too, much of the irrigation is practiced by traditional farmers, and is not significant. According to a 1984 FAO study, the potential identified in the Blue Nile basin includes 100,000 ha of perennial irrigation, requiring storage, and 165,000 ha of small-scale seasonal irrigation. The other riparian countries, Burundi, Rwanda and Zaire, have no potential for irrigation in the basin and depend almost completely on rainfed agriculture (UNDP fact-finding mission report).

The expansion of irrigated agriculture in the years ahead will require basin-wide cooperation in the management of water resources to meet increasing demands and to face the environmental consequences associated with them. The downstream states have vast experience in this sector, which through cooperation, could be put at the disposal of the upstream countries. Meeting the increasing demands for irrigation will require careful planning and development of control works and conservation techniques in the different reaches of the river in terms of storage and swamp reclamation to increase the river's yield. These pose major challenges, requiring basin-wide cooperation for sound environmental management of the basin's water resources. The hydro-power potential of the Nile basin also offers vast opportunities, particularly in the upper reaches of the Blue Nile and the White Nile, and the Main Nile in northern the Sudan and offers scope for basin-wide networks reaching arid regions. Along the river, there are no apparent conflicts between power and irrigation demands. On the contrary, the development of the power potential in the upper reaches of the basin will tend to improve the dry season flows of the river to meet irrigation demands and will open up opportunities for basin-wide cooperation in this respect (Biswas, 1994: 174-175).

Through it is not certain, there is a fear that the changing trends in annual precipitation yields and patterns which have been witnessed in the Nile basin could be attributed to climate change. Increasing greenhouse gas concentrations could influence the discharge regime of the basin. This is another challenge that requires technical and scientific capabilities, with concerted cooperation within the basin. Persistent drought and the associated environmental degradation continue to hit many parts of the basin and are matters of great concern for the future integrity of the basin's resource base (Biswas, 1994: 175).

Ethiopia's potential for hydropower development is enormous. A proposition of far-reaching potential importance to the future of the Nile water supplies would be the construction of a series of dams in Ethiopia. It is argued that Egypt's development is constrained more by lack of power than lack of water. Thus, a mutually beneficial arrangement would appear to be possible with respect to water and power, whereby Egypt would agree to a greater water allocation for Ethiopia and to the construction of Blue Nile Reservoirs on the condition that a certain percentage of the electricity, the Blue Nile Reservoirs may be more valuable for their hydroelectric power generation than for water regulation and storage. Reservoirs would also control Blue Nile floods, which could be particularly beneficial to the Sudan. Added upstream storage would facilitate expansion of Sudan's gravity-fed irrigated areas, which in turn would mean greater crop production. It could be possible to arrangement whereby Ethiopia would trade electricity to Egypt and the Sudan in return for agricultural and industrial products (Encylopaedi Britannica, 1998: 659)

The countries of the Nile basin are all deficit economies facing difficult challenges with respect to economic development. Only Zaire and Uganda have had positive balances in the last decade. The largest and most populous countries, Egypt, the Sudan, Ethiopia and Tanzania, have negative trade balances approaching, or in excess of, per cent. Meanwhile only Egypt has an economy of a sufficient size to finance major capital works such as are essential preliminaries to land reclamation and afterwards the additional expenditure needed to provide the engineering and social infrastructure to sustain a stable and self-sufficient rural community. Even so the land reclamation costs alone would be beyond the competence of the Egyptian economy, requiring an amount equivalent to over half the annual GNP of the late 1980s. Because the Egyptian economy does not have capacity to meet this level of investment Egypt has found it very difficult to escape dependence on international agencies and other bilateral sponsors to fund its land reclamation programme with all the attendant frustrations. Economies enjoying annual GNPs of more than ten times that of Egypt find it difficult to mobilize the levels of investment required to extend Egypt's irrigated area (Allan ed al., 1994: 306).

(L). THE ASWAN HIGH DAM

The plan to build a High Dam at Aswan had been envisaged by the Greek-Egyptian engineer Adrian Daninos in 1948, and this offered Nasser an opportunity to strengthen his domestic support after replacing Muhammad Naguib in 1954, and to bring legitimacy to his regime (Smith, 1986: 551-62).

The decision to construct the Aswan High Dam was made after Nasser came to power in 1952. Some in Egypt objected to the plan, but Nasser prevailed (Little, 1965: 56). The Aswan High Dam was intended to ensure a regular supply of drinking and irrigation water all year-round, during flood season and low water season, and every year, whether wet or dry (Howell & Allan, 1994: 91).

The plan was also to use 300,000 hectares of farmland more efficiently in sector from Aswan to Isna through irrigation during the Nile High water season (Collins, 1990: 163).

In 1952 two German companies arrived in Egypt to plan the Dam. That year a reparations agreement was signed between Germany and Israel and German government, seeking a balance between aid to Israel and aid to Arab countries, gave the Egyptian government a grant to finance the work of these two companies.

The United States, Britain and Germany offered to finance jointly the implementation of stage 1 of the Dam. But Nasser, wary of political dependence, asked that they finance both stage. In 1955-56, following the Czech-Egyptian arms deal, the nationalization of the Suez Canal, and the Suez war, negotiations with the three Western Countries, which now refused to finance even stage 1 of the Dam, ceased and Egypt turned to the Eastern bloc (Badour, 1960: 222).

In 1956 the Soviet Union agreed to finance the two stager of the Dam. The Russian accepted the general lines of the German companies' plan, but required certain structural modification. In October 1958, after all the alternations were inserted, Egypt and the Soviet Union signed the final agreement (Waterbury, 1979; 1994: 112).

The Aswan Law Dam was built in 1902 to save flood waters for dry season irrigation. The much larger Aswan High Dam took eleven years to build and required materials equal to seventeen Egyptian pyramids (Abu-Zeid, 1983: 92-101). It is a rock fill dam that controls the majority of the Nile's flow through Egypt. The resulting reservoir, Lake Nasser, is the second largest manmade lake in the world, with a reservoir capacity of 169 billion cubic meters (The New Encyclopedia Britannica, 1998: 659).

Meanwhile the Western powers were apprehensive about Nasser's strategy of 'non-alignment, and persuaded the World Bank to withdraw from its commitment to help Egypt funds this very expensive project.

In retaliation, Nasser nationalized the Suez Canal Company and approached the Soviet Union for the financial and technical assistance that

Nikita Khrushchev was more than willing to provide in order to find an ally in the region (Smith, 1986: 72-521).

The Aswan High Dam was by then receiving the serious attention of Egyptian engineers. Moreover, it had also become something of a symbol of national aspirations under the Nasser regime. There seemed, even then, some prospect that it would supersede the Equatorial Nile project since full seasonal control would be achieved at Aswan within Egyptian territory (Morrice and Allan, 1958: 76).

The Aswan Dam, six mile south of the existing dam, was selected because the igneous rocks there could bear the weight of the dam except in the event of earth quakes and tremors. An entire nation could be harmed by a flood if the Dam were destroyed, sank, or fractured (Waterbury, 1994: 36).

Work started in 1960, and the dam that came into operation in 1971 created one of the largest man-made lakes in the world (Smith 1986: 498-71). The building of the Aswan High Dam, itself and its connection to the two smaller Dams. At the same time twelve electricity generators were set up on the dam, each with a production capacity of 175,000 kilowatts.

The Aswan High Dam completion of the dam the water level has never exceeded 567.5 Feet, that is, the lake has not held more than 110-111 billion cubic meters annually. This is the volume needed to obtain 55-60 billion cubic meter of usable water. The calculation of water available for use is the following: 1110-120 billion cubic meter minus 30 billion cubic meter; leaves 80-90 billion cubic meter; 80-90 billion cubic meter minus 10 billion cubic meter leaves, 70-80 billion cubic meter, 70-80 billion cubic meter minus 18.5 billion cubic meter, intended for Sudan according to the accord, leaves Egypt with 51.5-61.5 billion cubic meter (Waterbury, 1994; Whittington et al., 1995: 68-79).

The Aswan High Dam rises to a height of 360 feet, runs 2.38 miles in length, and is 3,200 feet across at the base on the river. Its lake is 280 miles long and its average width is about 6 miles. The reservoir can retain about 160 billion cubic meter of water, and when full it rises to 597 feet above sea level. Usually the lake is not completely filled, for several reasons. First, room must be left for water during unexpected floods, second, at a height of 597 feet above sea level the lake attains maximum level, and evaporation and seepage also reach their maximum. The evaporation level was planned to reach 10 billion cubic meter of water annually, but at 597 feet above sea level it increase to reach 15-16 billion cubic meter annually. And third, at 597 feet the pressure on the dam and its foundations is enormous, to the point of endangering its stability (Waterbury, 1994; Whittington et al., 1995: 304-342).

In 1902 the first storage Dam was built in Egypt, the Old Aswan Dam. It was elevated for the first time in 1912, and again in 1933. The storage capacity of the dam rose from 1 billion cubic meter in 1902 to 5.7 billion cubic meter in 1933, after the construction of the Aswan High Dam the capacity increased to 6.3 billion cubic meter. In addition, two other dams were built outside of Egyptian territory, the Sennar Dam and the Jebel Awliya Dam. These were intended to prevent the outflow of the river water into the Mediterranean in the in the high summer season. The Sennar Dam was built in 1925 in Sudan on the Blue Nile. It has a carrying of 1 billion cubic meters and it serves the needs of Egypt and of the Sudan for irrigating the Jezira (Collins, 1990a: 248-249). Thus, the total water carrying capacity of Egypt Prior to the construction of the Aswan High Dam amounted to about 9 billion cubic meter and Egypt used about 48 billion cubic meter (Collins, 1990a; 1990b; 1994: 109-136).

In Egypt some circles are concerned by the degradation of the Nile channel and loss of soil fertility caused by arresting the silt behind the dam. Some other objections were politically motivated against the government at that time. In the Sudan the opposition took other directions, particularly from those directly affected by the submergence of their home.

The two country's reactions were of two types. First, the upstream riparian states expressed anger at the fact that the two downstream countries had divided all the water that reached Aswan between them selves, neglecting their neighbours legitimate rights on these waters. Thus created an atmosphere of passive conflict, which has prevailed to the present times. On the hand, international circles were partly about the threats to archaeological treasures, but mainly, as it proved, their reaction was a political one against the Egyptian revolution.

The Aswan High Project proved that it was the only option available at that time to manage the conflict between the two main downstream countries, Egypt and the Sudan. It has proved its economic viability to Egypt and has been as an effective shield against the floods and droughts that have occurred since its implementation (Biswas, 1992: 67-69).

(M). MAJOR IMPACT OF THE HIGH DAM

The Aswan High Dam has been the subject of long running controversies because of its harmful side- effect downstream. These have been connected with the loss of the fertile silt which was previously deposited on Egyptian farmland by the annual flood, or fed the Sardines off the Mediterranean coast which sustained an important fishing industry. Because the river below Aswan is no longer burdened with a heavy load of silt, it flows faster, scouring its banks. Now that the coast-line of the Delta is no longer being built up by deposits of silt, erosion is causing it slowly to recede (Biswas, 1991: 61-65). Erosion of land in the river flow causes Egypt to lose thousands of acres of good agricultural land. The loss of topsoil has severely harmed agriculture, and sale of agricultural land for brick manufacture reduces its total area in Egypt (White, 1988: 11).

The loss of soil the Nile now flows from Aswan Smoothly and quickly, which increases erosion of the riverbed and banks. The process is especially dangerous near the foundation of Dams, bridges, and dikes from north of Aswan to Cairo. The soil loss has also disturbed the balance between the advance of the delta and the destruction of the coast by sea waves, and a serious problem of coastal erosion has developed (Guariso, 1983: 89).

The impact of the Aswan High Dam is the loss of water to evaporation from the vast surface area of Lake Nasser. The certainly have international implication, because it 'consumes' water that could have been used elsewhere if storage had been provided in a cooler and more humid location. As the area in which the lake is situated is intensely hot and dry, surface evaporation is about 2.7 meters of depth a year one of the highest rate on the Earth's surface (Allan, 1993b: 85-134).

Table No-5.5

Aswan High Dam

Lake Nasser storage evaporation and electricity production

Water level	Lake area (km2)	Volume of water (bm3)	Evaporation (bm3)	Electricity production (MW)
185	7,174	182.7	15.3-16	1,750
175	5,108	126.5	14.0	1750
164	3,454	74.3	9.4	1200-1500
150.0	1,962	34.3	5-7	850
147.0	1737	31.6	3-5	0
123.0	540	6.8	1	0

Sources: Waterbury, 1979; Gischler, 1979; Shahin, 1985

Annual loss of water due to evaporation would be 10 billion cubic meters and to seepage and additional 2.0 billion cubic meters.

The poor drainage system has increased soil salinity in Egypt. Salinity has also been caused by the rise in salinity of Lake Nasser water, through evaporation. Saline water penetrates the Nile delta and salinates the delta soils. According to estimates 35 percent of the land and 90 percent of Egyptian water is subject to salination. The problem of soil salination should be eased some what in the drainage project is completed having been in progress in the delta (White, 1988: 10).

The Aswan High Dam led to an eruption of the disease, which increased from five percent of the population in 1968 to 76 percent in 1993 (David, 1998: 817-819). People are infected with it through contact with water infested with bilharzias larvae in one of their immature stages. The larvae penetrate the skin and pass to the liver where they mature; from the liver they enter the mesentery or the urinary tract. There they reproduce and lay their eggs, which return to the water in face or urine. In the water the eggs hatch and the larvae that emerge penetrate the bodies of certain snails, which are their intermediate hosts. The numbers of people infected with bilharzias likewise increased, both in the Nile valley and along the shores of Lake Nasser (White, 1988: 10-15).

(N). THE JONGLEI CANAL PROJECT

In return for helping Jaafar Nimeiri former Sudanese President, to remain in power, Egypt obtained a number of concessions from the Sudan, notably permission to construct the Jonglei Canal in 1976. The first phase of the project was designed to divert part of the flow from the Bor to the mouth of the Sobat, another tributary of the White Nile, in order to decrese the loss of water that occurs, especially from evaporation, when the river passes through the Sudd swamps in southern the Sudan (Collins, 1990: 156). The proposed second phase, which included dams at Lake Victoria and Albert, and drainage schemes for the Machar Marshes and Bahr el-Ghazal, as well as another and longer Jonglei Canal, could be described as Egypt's master water plan. It was expected to supplement the annual flow by 4.7 billion cubic meters of water, of which Lake Nasser's share was to reach 3.8 billion.

The need for enhancing the supply to Aswan arose due to the noticeable decrease in the quantity of water flowing into Lake Nasser, which had been reduced since 1980 as a result of population growth and continuing drought in the upstream areas. In accordance with the provisions of the 1959 agreement, Egypt wanted to develop the White Nile waters in the Sudan and held a claim on the anticipated increased flow (Dinar & Wolf, 1994: 58). However, the planning and implementation of the Jonglei I Project, like the Aswan High Dam, received wide public scrutiny, and the water diversion issue became highly politicized within and outside the basin. The seasonally flooded areas of the Bor are a vital component of the Sudd, since the river-fed grasslans provide the grazing grounds for the animals in the area, (Howell; Michal & Stephen, 1988: 13-61) and it was claimed that the changes would have a damaging impact on the lives of some 40,000 pastoralists. It was also feared that the Jonglei Canal was bound to create communication problems in the region as well as adversely affecting the rainfall and climate by reducing the evaporation to the atmosphere (Sutcliffe & Parks, ed al., 1996: 147) it was widely believed that the project would bring benefits to the people of northern Sudan and Egypt at the expense of those who lived in the south.

A French company began to construct the Jonglei Canal in 1978, but after 250 kilometer of the planned 360 kilometers had been completed, a series of attacks by the Sudanese People's Liberation Army (SPLA) caused the work to be forcibly suspended in 1984 (Suliman, 1992: 21). Thus ended the first serious efforts to increase the yield of the Nile, and the incomplete canal became a dangerous ditch for the human beings and wildlife of that region (Collins, 1987: 25).

The benefits that the Jonglei Canal would bring were listed as follows:

- I would reduce the damaging effect of flooding from Bahr-el-Jebel in year of high discharge. Collins estimated that the floods of 1961-64 caused disastrous flooding in the Sudd and that tens of thousands of people perished (Collins, 1990b: 168).
- It would carry 20 million cubic meter of water per year or 4.67 billion cubic meters per annum, or 3.8 billion cubic meters as measured at

Aswan. In 1981 it was decided to increase the water flow in the canal to 25 million cubic meters per day.

- It would improve river transport by shortening the navigational distance between Kosti and Juba by some 300 km.
- It would improve road transport by providing an all-weather road along one of the canal embankments.
- It would provide year-round water supplies along the line of the canal for the benefit of the local population (Hoewll; Lock & Cobb, 1988)

(O). TECHNICAL AND LEGAL CAPABILITY OF NILE STATES TO DEAL WITH THE MANAGEMENT OF THE NILE

Many Nile states do not have the technical and legal framework necessary for addressing domestic and international Nile problems. With the exception of Egypt, the technical and legal management of water resources in Nile countries is fragmented among sectors and institutions. Water and energy ministries are sometimes combined. In other cases, water and energy ministries are sometimes combined (Biswas ed.al, 1994: 76-175). In other cases, water and environment are dealt with in the same ministry (Mohammed & Bayoumi, 1994: 15-19). In the Nile region, the regulatory style of dealing with these topics and the structure of ministries are constantly changing. In order for states to come to an agreement on the use and management of the Nile, all of them must have a threshold technical and legal capability to negotiate and cooperate effectively. The states need not have the same type of domestic regulatory structure, but each must have a coordinated system for effectively handling the Nile issues. The current frameworks for dealing with water issues in Egypt, the Sudan, Ethiopia, and Uganda, which all will be major players in Nile water use in the twenty-first century, are assessed below (Carroll, 1999: 269).

5.8: EGYPT

Egypt is the strongest state in the region in terms of technical and legal capacity to manage water resources, per capita GDP, and military strength. The Ministry of Public Works and Water Resources governs water resource issues (Mageed, 1994: 175). The Ministry has reformed the state's water policy several times since the 1970s. Recently, the Ministry of Public Work and Water Resources implemented demand management measures, such as abstraction of shallow groundwater, reuse of agricultural drainage, reuse of treated sewage, reduction of aquatic weeds through biological methods, introduction of water-saving domestic appliances, use of seawater for cooling in power generation plants, changes in industrial processes, and irrigation improvement (El-Shamy & Attia, 1999: 7-8). The Ministry has formulated an elaborate policy for the twenty-first century based on demand management, resources development, and environmental protection. The Ministry will continue crop pattern reform in order to reduce the cultivation of water-intensive crops such as rice and sugar. The new policy also includes an irrigated agriculture sustainability program and efficiency measures water losses from evaporation and infiltration.

In addition to the Ministry of Public Works and water Resources, a number of government offices handle water and environmental issues. The Water Research Centre encompasses eleven institutes, five of which directly relate to the Nile (Egypt's Water Policy, 1999: 2-11). The Ministry of State for Environmental Affairs also has jurisdiction over Nile pollution issues; the environmental ministry launched the Nile Pollution Prevention Program in 1997 to curb industrial pollution of the Nile (Ebeid & Hamaz, 1999: 8). Even though several ministries and institutes handle Nile issues, Egypt has been successful in efficiently coordinating these groups. Egypt has a great depth of personnel trained and experienced in all aspects of water resources management Egypt, therefore, has the regulatory structure and technical staff necessary to handle Nile issues (Mageed, 1994: 23-46).

5.9: THE SUDAN

The Sudanese department of Irrigation was created in 1925. In 1956, it became the Ministry of Irrigation and Hydro-Power. Later, the hydro-power functions were transferred to the Ministry of Energy and Mineral Resources. In the 1970s, UNESCO helped the Ministry of Irrigation establish a hydraulic research station (Mageed, 1994: 153). The reorganized Ministry of Irrigation and water Resources one handles many Nile issues (Abbas, 1999: 15-19). Environmental ministries also have jurisdiction over water. The Sudan established a National Council for the Environment in 1992 and a Ministry for Environment and Tourism in 1994. The Ministry of health and the National Water Corporation, however, monitor water quality. In addition, the Sudan is enacting a National Environmental law with water components based on its existing national Water Resources Law, Environmental health Ordinance, water Pollution Control Act, and irrigation and drainage law. The water management strategies of the various Sudanese water and environmental ministries reflect water's status as a public good in the Sudan. Due to religious and cultural concerns, there are no private water rights in the Sudan (Abbas, 1999: 14).

The Sudan currently monitors water at rainfall gauging stations, meterological stations, and suspended sediment sampling stations, state discharge measuring stations, and groundwater boreholes. The Sudan, however, needs to modernize water-monitoring techniques, rehabilitate gauging stations, and replace water discharge and sediment monitoring equipment (Abbas, 1999: 10). The Sudan struggles to secure the resources necessary to operate its water and environmental ministries and maintain water-monitoring facilities.

5.10: ETHIOPIA

Water resource management departments in Ethiopia have been reorganized several times in the last forty years. In 1958, the Ministry of

Public Works and Communications was given responsibility for water issues. That ministry was reorganized as the National Water Resources Commission in 1971. The Valley Agricultural Development Authority was added in 1977. The Ministry of Agriculture also became involved in water issues. The National water resources Commission were restructured to include the Water Resources Development Authority, Water Supply and Sewage Authority, Ethiopian waterworks Construction Authority, and national Meteorological Services Agency (Mageed, 1994: 176). The Ethiopian Valleys Development Studies Authority was created in 1987. Today, the Ministry of Water Resources handles water issues in Ethiopia. Ethiopia plans to draft a master plan in order to achieve efficient water use and self-sufficient food production and handle problems such as soil erosion, cleanliness of drinking water, and inability to effectively develop irrigate land.

5.11: UGANDA

Due to its geographic position as an upstream and downstream riparian state, Uganda is a critical participant in the management of the Nile. Uganda is downstream of Burundi, Democratic Republic of the Congo, Kenya, Tanzania, and Rwanda, and thus is directly impacted by their use of the Nile. As an upstream state, Uganda's use of the Nile directly affects the Sudan and Egypt. Because Uganda's water resources are not fully developed, it will play a key role in future Nile regional management arrangements.

After 1979, Uganda's hydro meteorological network collapsed, resulting in large gaps in data collection (Dribidu, 1997: 24-27). Uganda also has incomplete data on groundwater quantity and water quality. This country also does not have an integrated institutional framework for handling water resource matters.

Changes in government have led to many changes in water and environmental policies. In an effort to redefine water management at technical and legal levels, Uganda developed a Water Action Plan in 1994, which is incorporated in its 1995 Water Statute. The Action Plan outlines policy options and guidelines for the management and development of water resources in Uganda. In 1996, a draft National Water Policy was prepared and is now under review. In addition to water action plans and policies, Uganda's National Environment Action Plan and Management Policy of 1994 and the National Environment Statute of 1995 include provisions on water resource management and conservation. The Forests Act of 1964 and the Wildlife Statute of 1996 have watershed management provisions (Dribidu, 1997: 2-10).

The Water Statute and draft National Water Policy lay out a management structure for water resources. The Water Statute established a Water Policy Committee (WPC) comprised of Directors and Heads of Departments that relate to water resources management, representatives of selected district authorities, and major nongovernmental organizations (NGOs). The Permanent Secretary in the Ministry of Natural Resources serves as the chairman and the Director of water Development serves as the Secretary. Although the WPC serves as an advisory body to the Minister of Natural Resources, it has responsibility for identifying priorities, policymaking, and developing an international water resources policy. The Directorate of Water Resources and its four restructured departments (Water Resources Management, Urban and Institutional Water Supply, Rural Supply, and Inspection and Support Services) have responsibility for water supply and sanitation and the issuance of wastewater and water extraction permits. They also play an important role in water monitoring. The National Environment Statute of 1995 established a National Environmental Management Authority that has responsibility for, among other things, management of biodiversity, wetlands, watersheds, and pollution control (Dribidu, 1997: 9-10). Despite the powers given to the National Environmental Management Authority, it has inadequate administrative and enforcement resources (Waiswa, 1999: 15-19).

The 1996 draft national water Policy also provides for the integrated management of water and environmental management at the district level. It recommends that District Councils establish District Environment and natural Resources Committees and a District Environment and Natural Resources Committees and a District Environment and natural Resources Committees and a District Environment and Natural Resources department comprised of water, environment, and forest officers. At the local level, village water user groups are responsible for managing, operating, and maintaining point sources for water. Given recent political changes, coordinating water resources and environmental management among the various agencies and the national, district, and local levels will be difficult.

The Nile states do not have equivalent and technical capacities for addressing transboundary water resource issues. The regulatory systems of Egypt, the Sudan, Ethiopia and Uganda provide examples of the existing disparities in technical and legal capacity. Much of the disparity is due to the inability of governments to prioritize water issues because of more serious problems in their countries, such as war and political instability. Burundi and Rwanda, for example, also have suffered from these problems. In Uganda, the structure of water management has gone through dramatic changes in recent years due to the fall and rise of governments.

In order for countries to move towards cooperation on Nile issues, they first must try to resolve their serious domestic issues and develop their technical and legal capacities to deal with water issues. With basin knowledge of the Nile's hydrological parameters and domestic regulatory frameworks for recognizing and elaborating domestic policy interests, positions, and goals, the Nile states will be in a better position to negotiate with each other. Once they are able to negotiate on a more comparable level, the regional cooperative system that they create and legal capacities. Nevertheless, efforts at national level are prerequisites to a regional agreement.

(P). RECENT COOPERATION AND CAPACITY—BUILDING

Another prerequisite to the negotiation of a formal Nile agreement is the development of smaller more informal forums for regional cooperation that help built relationships and trust. In 1992, the Council of Ministers of the Nile Basin States (COM) launched a new initiative to promote cooperation and development in the Basin COM initiated the Nile 2002 conference series on the Comprehensive Water Resources Development of the Nile Basin (Nile Basin Initiative, 1998: 13-32). Nile state ministers meet in a different capitol every year for a conference to discuss common Nile problems and potential future cooperation. Recent themes included "to benefit all" in 1998 and "vision for the next century" in 1999.

In December 1992, the Ministers responsible for water affairs in the Nile countries also formed the Technical Cooperation Committee for the Promotion of the Development and protection of the Nile Basin (TECCONILE), a transitional mechanism for Nile cooperation TECCONILE replaced the Hydromet framework for technical cooperation that was established in the 1960s. Egypt, Rwanda, the Sudan, Tazania, Uganda, and the Democratic Republic of the Congo are members of TECCONILE, but Burundi, Eritrea, Ethiopia, and Kenya are only observers (Kirugo, 1999: 4-72). In 1995, TECCONILE developed a Nile River Basin Action Plan with funding from the Canadian International Development Agency (CIDA) (Nile Basin Initiative, 1994). The plan included a wish—list of a number of technical assistances projects.

(Q). CREATIVE OUTCOMES RESULTING FROM RESOLUTION PROCESS

Some financing arrangements were creative, with Egypt agreeing to finance water enhancement projects in Sudanese territory, in exchange for the water which would be made available. Provisions were made for Sudan to pick up responsibility for up to 50% of costs in exchange for up to 50% of the water, when their water needs required.

Table No-5.6
Timeline

1920	Nile Projects Commission formed, offers allocation scheme for Nile riparians. Findings were not acted upon.
	Century Storage Scheme put forward, emphasizing upstream, relatively small-scale projects. Plan is criticized by Egypt.
1925	New water commission is named.
7 May 1929	Commission study leads to Nile Waters Agreement between Egypt and Sudan.
1952	Aswan High Dam proposed by Egypt . Promise of additional water necessitates new agreement.
Sep-Dec 1954	First round of negotiations between Egypt and Sudan . Negotiations end inconclusively.
1956	Sudan gains independence. Egypt is more conciliatory with government after 1958 coup.
8 Nov 1959	Agreement for the Full Utilization of the Nile Waters (Nile Waters Treaty) signed between Egypt and Sudan.
1967-1992	Launch of Hydromet regional project for collection and sharing of hydrometeorologic data, supported by UNDP.
1993	Formation of TECCONILE (Technical Cooperation Committee for the Promotion of the Development and Environmental Protection of the Nile Basin) to address development agenda for the Nile basin.
1993	First of ten Nile 2002 Conferences for dialogue and discussions between riparians and international community, supported by CIDA (Canadian International Development Agency.)
1995	Nile River Basin action plan created within TECCONILE framework, supported by CIDA.

1997-2000	Nile riparians create official forum for legal and institutional dialogue with UNDP support. Three representatives from each country (legal and water resource experts) and a panel of experts draft a "Cooperative Framework in 2000.
1997	Formation of Nile-COM, a council of the Ministers of Water from each of the riparian nations of the Nile Basin.
1998	First meeting of the Nile Technical Advisory Committee (Nile-TAC).
May 1999	Nile Basin Initiative established as a cooperative framework between *all* riparians (excluding Eritrea) for the sustainable development and management of the Nile.
May 2004	First basin-wide project under NBI, the "Nile Transboundary Environmental Action Project," launched in Sudan.

Sources: Nile Basin Initiative (NBI). See
http://www.nilebasin.org/Documents/TACPolicy.html.

(R). CONCLUSION

The legal regime and geopolitical setting in the Nile's basin seriously limit the possibilities of integrated river basin planning of water utilization of the Nile. The past legal agreements for Nile water allocation were subject to Egyptian hegemony and its initial espousal of the doctrine of absolute territorial integrity which was later replaced by the doctrine of limited sovereignty. Egypt also insists upon prior use of the Nile as a legal right which entitles it to the greatest portion of the Nile's water. Ethiopia, on the one hand, and the Equatorial states, on the other, claims their own sovereign right to the utilization of water resources within their own territories. There is no single legal statement or agreement which acknowledges that all the co-riparian states of the Nile have rights to its water resources or that these rights are limited in any way and guided by the principle of just and equitable water sharing.

The factors that determine the fair division of international river water are the geography of the drainage basin; its climate and hydrology; past and present use of basin water; economic and social needs of the basin riparian states; the degree of dependency on the river water; the cost of alternative projects for water use; the existence of resources other than water; the no wasteful use of basin water; and the possibility of providing compensation for damage caused.

Egypt has historical rights to use Nile water since the start of human civilization. Sudan also has historical rights, less than Egypt but more than the upstream states, which began using Nile water only recently. Egypt and Sudan are the only users of the river water. The beginnings of a crisis have materialized along the Nile as well. Ethiopia, making movements toward state building for the first time in a generation following the overthrow of the Mengistu regime in 1991, has focused upon water distribution as an issue of paramount concern. The North African country, currently ravaged by conflict with Eritrea, possesses neither the economic stability nor the investor confidence to facilitate desalination efforts. Consequently, Ethiopia has increasingly objected to the water use of neighboring Egypt, claiming present allocation-regulated by a 1959 agreement over Nile and Sudan, Ethiopia has hinted it may resort to a unilateral exercise of sovereignty or a military confrontation with Egypt.

All the basin states are dependent on agriculture, which is their principal source of income. Egypt is less dependent on agriculture than the others because it has other sources of income, but it is more dependent on river water than the other. All the countries in the region are considered to be developing states in socioeconomic terms. In all of them the natural growth rate is high and they cannot match it with agricultural development, and they all import a large part of their food.

The accords signed by Ethiopia and Sudan in 1991 and by Ethiopia and Egypt in 1993 also suggest that discussion and negotiation are more likely than war. Of course, there is a great distance to travel between these general declarations of intent and a new apportionment of the Nile waters that take Ethiopian requirements into account, let alone the cooperative management of the basin as a whole. The current hostility between Egypt and Sudan is a major obstacle to progress.

The Aswan High Dam Agreement was written for the mutual benefit of Egypt and the Sudan but totally ignored the other co-riparian states' rights to equitable allocation based on the principles of geography, climate and hydrology.

Linkage is the key to the analysis of Egyptian policy towards co-riparian states, especially the Sudan. It is the Nile flow which determines Egyptian policies of pacification, on the one hand (in Sudan), or threats of war, on the other.

The conflict in the Nile is a stakeholder conflict which is usually solved because of Egyptian domination of the Nile regional leader-a fact which assists in the amelioration of conflicts.

Chapter-VI

International Law

(A). THE NATURE OF INTERNATIONAL LAW

The evolution of International River Laws has taken many centuries and the process still continues. A number of principles and treaties for management, sharing, utilization and conservation of International and conservation of International Water Resources have been codified during the past two centuries (Naff & Maston, 1984: 158).

The success or not of the installation of water Law and International Water Law will depend on the social adaptive capacity of the players at the different levels of water allocation and management communal, national and international. At the turn of the twenty-first century addressing the politics of adoption is a more important priority than arguing the quality of the legal principles (Bulloch & Darwish, 1993: 232-295).

Navigation monopolized all major waterways. Consequently, International Law concerning navigation rights is now well developed (Sevett, 1952: 22). But International Law relating to the economic uses of rivers for consumptive purposes is still in the process of development (United Nation, 1957 : 15).

In the case of International Law, water of common interest, the most helpful evidence of this practice is to be found in a number of bilateral treaties and certain multilateral treaties and conventions (Briggs, 1952: 274).

In International Law, a distinction is normally drawn between National and International Rivers. A river, which passes through or along the territory of two or more states is described as International River and is governed by the rules of the International River Law (Kaeckeabeek, 1962: 1).

The utilization of the waters of an international drainage basin raises many problems with respect to both International relations and International law. Water rights have been the subject of state concern ever since the earliest appearance of any from of state organization. In the light of the most recent research it may not even be going too far to organization (Hirsch, 1959: 168-186).

In the area of management of international water bodies, the geopolitical considerations and hydropolitical implications for the co-basin countries cannot be divorced from the technical, legal, economic and environmental issues. When water becomes scarce and is considered be a strategic national resource, hydropolitics needs to be taken into account for the national management of international water bodies (Biswas, 1993: 179).

Law, an instrument which can be used to smooth resources, provides guidelines for ordering future conduct. Law can be determined by a court action which may set a precedent that becomes a "guideline" for future cases but may also come from legislation by an administrative body, for example a government, which passes a statute when it sees a need. According to Barrow (1987), in many countries the state constitution affects water rights and water management because it binds legislation and common law or its equivalent (Barrow, 1987: 68).

International rivers are of two general categories: those that flow between the land territories of two or more states, and those that flow from the territory of one state into the territory of another state. In the case of a successive river one state is in complete physical control of the river as it passes through its territory, while in the case of contiguous rivers, there is dual physical control of the waters. Even the geographic distinction between the two kinds of rivers can, in some cases, be more apparent than real, for a river may be both successive and contiguous (Garretson & Hayton, 1967: 17).

The states located uppermost in the drainage basin of an International river are normally in a position to exercise its control over the waters first. Generally, there can be only one such "upper basin state" since all other states within the drainage basin are "lower basin states" with respect to that state, although, in turn, some may be "upper composed of a tributary stream in addition to the principal river, there may be more than one upper basin state relative to all other co-basin states (Garretson & Hayton, 1967: 1).

In general, the rights of any country with respect to a river pertain only to that section that lies within its territory and under its sovereignty. More precisely, the rights of the country pertain to the river bed rather than to the water, since it is limited by International Law in what it may do with the water; and what it can do with the water may be done only as long as the water is in that part of the river bed in that particular state's territory. A river that crosses the borders of a country remains under that country's jurisdiction only as far as the border of the next country, where the river becomes part of the territory of a different state (Hirsch, 1956a: 207).

It is an assumption of international law that the allocation of scarce resources requires legal adjudication if conflict is to be avoided. International law recognizes the community of property among riparian states as a customary rule of law, that is, each of them is entitled to use a share of the river so long as unreasonable injury to another riparian does not ensue. Although this principle has been upheld in the courts, it contains an inherent weakness and has also been challenged by countervailing legal arguments. The flaw lies in the fact that customary rules tend to be highly unstable unless all involved parties have compatible interests, preferably guaranteed by formal agreement. International law has recognized that a river is the property of the community of all riparian states and this has been followed by recognition of the existence of certain limitations to territorial sovereignty in favour of the international community in general. However, the first step toward translation legal theory into institutional application is the production of political agreements. Such facts are essential to the creation of a broader array of legal instruments for solving international disputes over shared water resources (Naff & Matson, 1984: 5).

6.1: THE LAW OF INTERNATIONAL WATER RESOURCES

The International law Association, at its meeting in August 1956 in Dubrivnik, Yugoslavia, unanimously adopted a statement of principles "as a sound basis upon which to study further the development of rules of international law with respect to International River". The parties to international water disputes might go far towards advancing adjustment and agreement (United Nation, 1970: 34).

There has been no attention paid towards a variety of issues such as topographic structure, hydroelectric potential, and the irrigation components, in addition to political, economic and sociological factors. However pending the establishment of an accepted international code, the Dubrovnik draft statement of principles potentially affords a sound basic philosophy for planning and executing a project for integrated river development in an international river basin.

Of particular importance in the statement of principles adopted in Dubrovnik in the fifth principle which is as follows:

"The states upon an international river should in reaching agreements, and states or tribunals in setting disputes, weigh the benefit to one state against the injury done to another through a particular use of the water. The following factors should be taken into consideration:

a) The right of each to reasonable use of the water

b) The extent of the dependence of each state upon the waters of the river

c) The comparative social and economic gains accruing to each and the to the entire river community

d) Pre-existent agreements among the states concerned

e) Pre- existent appropriation of water by one state" (United Nations, 1970: 35).

The International Law Association also evolve certain general rules of international law applicable to the use of waters of an international drainage basin, in its fifty-second Conference in Helsinki in 1966.

The Helsinki rules introduced the concept of international drainage basins as: "the aggregate of both surface and ground water within a given geographic area flowing into a common terminus". The rights of basin states are outlined by the Helsinki rules which also attempt to establish an attitude towards a variety of issues that the Dubrovnik draft avoided. The heart of the 37 article Helsinki rules is Article 5, whose recommendations contain the "relevant factors which are to be considered included, but are not limited to:

a) The geography of the basin, including in particular the extent of the drainage area in the territory of each basin state;

b) The hydrology of the basin, including in particular the contribution of water by each basin state;

c) The climate affecting the basin;

d) The past utilization of the water of the basin, including in particular existing utilization;

e) The economic and social needs of each basin state;

f) The population dependent on the waters of the basin in each basin state;

g) The comparative costs of alternative means of satisfying the economic and social needs of each basin state;

h) The availability of other resources;

i) The avoidance of unnecessary water in the utilization of water of the basin;

j) The practicability of compensation to one or more of the co-basin states a means of adjusting conflict among users;

k) The degree to which the needs of a basin state may be satisfied without causing substantial injury to a co-basin state.

The weight to be given to each factor is to be determined by its importance in comparison with that of other relevant factor. In determining what is a reasonable and equitable share, all relevant factors are to be considered together and conclusions reached on the basis of the whole (Manner & Metsalampi, 1988: 22).

In 1970, Finland introduced a resolution in the UN General Assembly on laws for international watercourses, which proposed that the Helsinki Rules be considered a model. While the UN Committee felt that the subject of international watercourse law was important, three reservations about the Helsinki rules surfaced. First, the rules were formulated by a professional organization which did not represent nation-states. Secondly, some countries such as Ethiopia argued that adoption of these rules as a model could preclude new considerations about this complex issue. The third was expressed in the fact that the Helsinki rules were based on a drainage basin approach that could be a potential threat to national sovereignty (Biswas, 1993: 172).

The important case submitted before international arbitration was the case of Lake Lanu situated between France and Spain. The International court of Arbitration in its review of that case came out with certain relevant principles:

a) The necessity of recognizing the right of sovereignty over its portion of the international river, of each riparian;

b) This right, however, should be subservient to all other international obligations of that riparian state;

c) There is no rule in international law which prohibits a riparian from the utilization of water-force to generate electricity, but in accordance with the rule of good faith the upper river riparian should take into consideration, and on the same footing of equality, all the interests of all other riparian states;

d) The necessity of consultation and the exchange of all relevant information among the riparian states about any projected constriction work on the international river.

Other Federal Courts in other Federal Governments have reached a consensus about the following principles:

a) International Law limits the freedom of action of the riparian states of an international river: every one of them should avoid causing any detriment to other riparian states;

b) Equitable apportionment of the international river's water;

c) Due respect to acquire rights of the riparian states;

a) The illegality of diverting the set course of an international river

Water Commissions in the Indian sub-continent, in their review of inter-state water disputes, have added yet another important principle, namely that barren infertile land have a priority over the waters of international rivers (Howell & Allan, 1990: 224-228).

6.2: THE RIPARIAN APPROACH TO INTERNATIONAL LAW

From the theoretical point of view, an upper riparian state will initially claim "absolute territorial sovereignty" and this means claiming the right to do whatever it chooses with the water regardless of the effect of the activity upon other riparian states. Lower riparian states begin with a claim to the "absolute integrity" of the watercourse which means claiming that the upper riparian state can do nothing that affects the quantity or quality of water that flows down to the lower riparian states (Dallapenna, 1993: 13). The quantity of water to which each state is entitled might be defined according to some more or less objective measure of need such as historic pattern of use, population, area, arable land or the United Nation's clear idea that each state is entitled to an "equitable share" of the river's water (Ergil,1991: 55).

The Articles of the 1997 Convention are afflicted by politically determined contradictions. The role of the principles of international water law in currency at the end of the twentieth century in the West Asia river basins has been to provide conflicting legal principles to serve the arguments of contending riparian states. First, the principles are 'prior use' and no harm; favour the long standing downstream user. Secondly, versions of 'sovereignty', all of which have an intuitive appeal, are favoured by the upstream user and especially the new upstream user. Both sets of principle lend themselves to popular and very selective chauvinist advocacy. Thirdly the concept of 'equitable utilization', a consensus converging notion developed by the International Law Association in Helsinki in 1966 has only gained support amongst legal professionals and some outsider scientists. The International Law Commission articles produced in May 1997 cannot be precisely defined or effectively operationalised. They lead to impasse rather than resolution. They are not considered as tools with which to achieve agreement. They are not yet viewed as a language to achieve mutual understanding, nor as a means of analyzing issues in contention, nor as a set of guidelines to structure negotiations (Wouters, 1999a: 217-297).

The 1997 UN Convention defines an international water course as a system of surface and ground water constituting a unitary whole by virtue of their physical relationship, parts of which are situated in different states and normally flowing into a common terminus. Riparian states are expected to utilize the water course in an equitable and reasonable manner, in particular, with a view to attaining optimal and sustainable utilization. This requires taking into account:

- Geographic, hydrographic, hydrological, climatic, ecological and other natural factors;
- Social and economic needs of the riparian states concerned;
- The population dependent on the watercourse;
- The effects of the uses of one riparian states on the others;
- Existing and potential uses;
- Conservation, protection, development and economy of use and the costs of relevant measures;
- Availability of alternative.

Riparian states shall, in utilizing an international water course in their territories, take all appropriate measures to prevent causing significant harm to the other riparian states. They should cooperate with each other and exchange data and information regularly.

Background on the Convention on the Law of Non-Navigational uses of International Watercourses:

The convention on the law of Non-navigational uses of International Water courses was adopted by the United National General Assembly on May 21, 1997. The International Law Commission (ILA) began codifying the Law of International Watercourses in 1971. The ILC presented Draft Articles on the law of International Watercourses to the U.N. General Assembly in 1994. The General Assembly established a working Group to transform the Draft Articles into a Convention, and the Working Group completed its revision of the text in 1997.

Although the Convention is not specifically named "a framework convention", some members of the Working Group envisioned it as a Convention that would serve as a basin for future regional agreements. The Convention sets forth the major principles of Watercourses Law.

1. Major provisions of the Convention

The Convention defines Watercourse as "a system of surface water and groundwater's constituting by virtue of their physical relationship a unitary whole and normally flowing into a common terminus (UN May, 21; 1997).

Article 3: Watercourse Agreements

1. In the absence of an agreement to the contrary, nothing in the present Convention shall after the rights or obligations of a watercourse State arising from agreements in force for it on the date on which it became a party to the present Convention.

2. Notwithstanding the provisions of paragraph 1, parties to agreements referred to in paragraph 1 may, where necessary, consider harmonizing such agreements with the basic principles of the present Convention.

3. Watercourse State may enter into one or more agreements, hereinafter referred to as "watercourse agreements", which apply and adjust the provisions of the present Convention to the characteristics and uses of a particular watercourse or part thereof.

4. Where a watercourse agreement is concluded two or more watercourse States, it shall define the waters to which it applies. Such as agreement may be entered into with respect to an entire international watercourse or any part thereof or a particular project programme or use except insofar as the agreement adversely affects, to a significant extent, the use by one or more other watercourse States of the waters of the watercourse, without their express consent.

5. Where a watercourse Sate considers that adjustment and applications of the provisions of the present convention is required because of the characteristics and uses of a particular international watercourse, watercourse States shall consult with a view to negotiating in good faith for the purpose of concluding a watercourse agreement or agreements.

6. Where some but not all watercourse States to a particular international watercourse are parties to an agreement, nothing in such agreement shall affect the rights or obligations under the present Convention of watercourse States that are not parties to such an agreement.

Article 4: Parties to Watercourse Agreements

1. Every watercourse State id entitled to participate in the negotiation of and to become a party to any watercourse agreement that applies to the entire international watercourse, as well as to participate in any relevant consultations.

2. A watercourse State whose use of an international watercourse may be affected to a significant extent by the implementation of a proposed watercourse agreement that applies only to a part of the watercourse or to a particular project, programme or use is entitled to participate in consultations on such an agreement and, where appropriate, in the negotiation thereof in good faith with a view to becoming a party thereto, to the extent that its use is thereby affected.

PART II. GENERAL PRINCIPLES

Article 5: Equitable and Reasonable Utilization and Participation

1. Watercourse States shall in their respective territories utilize an international watercourse in an equitable and reasonable manner. In particular, an international watercourse shall be used and developed by watercourse States with a view to attaining optimal and sustainable utilization thereof and benefits there from, taking into account the interests

of the watercourse States concerned, consistent with adequate protection of the watercourse.

2. Watercourse States shall participate in the use, development and protection of an international watercourse in an equitable and reasonable manner. Such participation includes both the right to utilize the watercourse and the duty to cooperate in the protection and development thereof, as provided in the present Convention.

Article 6: Factors Relevant to Equitable and Reasonable Utilization

1. Utilization of an international watercourse in an equitable and reasonable manner within the meaning of article 5 requires taking into account all relevant factors and circumstances, including:

(a) Geographic, hydrographic, hydrological, climatic, ecological and other factors of a natural character;

(b) The social and economic of the watercourse states concerned;

(c) The population dependent on the watercourse in each Watercourse State;

(d) The effects of the uses of the watercourses in one watercourse State on other watercourse states;

(e) Existing and potential uses of the watercourse;

(f) Conservation, protection, development and economy of use of the water resources of the watercourse and the costs of measures taken to that effect;

(g) The availability of alternatives, of comparable value, to a particular planned or existing use.

2. In the application of article3 5 or paragraph 1 of this article, watercourse State concerned shall, when the need arises, enter into consultations in a spirit of cooperation.

3. The weight to be given to each factor is to be determined by its importance in comparison with that of other relevant factors. In determining what is a reasonable and equitable use, all relevant factors are to be considered together and a conclusion reached on the basis of the whole.

Article 7: Obligation Not to Cause Significant Harm

1. Watercourse State shall, in utilizing an international watercourse in their territories, take all appropriate measures to prevent the causing of significant harm to other watercourse States.

2. Where significant harm nevertheless is caused to another watercourse State, the States whose use causes such harm shall, in the absence of agreement to such use, take all appropriate measures, having due regard for the provisions of articles 5 and 6, in consultation with the affected State, to eliminate or mitigate such harm and, where appropriate, to discuss the question of compensation.

Article 8: General Obligation to Cooperate

1. Watercourse States shall cooperate on the basis of sovereign equality, territorial integrity, mutual benefit and good faith in order to attain optimal utilization and adequate protection of an international watercourse.

2. In determining the manner of such cooperation, watercourse States may consider the establishment of joint mechanisms or commissions, as deemed necessary by them, to facilitate cooperation in existing joint mechanisms and commissions in various regions.

PART III. PLANNED MEASURES

Article 11: Information Concerning Planned Measures

Watercourse State shall exchange information and consult each other and, if necessary, negotiate on the possible effects of planned measures on the condition of an international watercourse.

Article 12: Notification Concerning Planned Measures with Possible Adverse Effects

Before a watercourse state implements or permits the implementation of planned measures which may have a significant adverse effect upon other watercourse States, it shall provide those States with timely notification thereof. Such notification shall be accompanied by available data and information, including the results of any environmental impact assessment, in order to enable the notified States to evaluate the possible effects of the planned measures.

Article 13: Period for reply to Notification

(a) A watercourse State providing a notification under article 12 shall allow the notified States a period of six months within to study and evaluate the possible effects of the planned measures and to communicate the finding to it;

(b) This period shall, at the request of a notified State for which the evaluation of the planned measures poses special difficulty, be extended for a period of six months.

Article 15: Reply to Notification

The notification States shall communicate their findings to the notifying State as early as possible within the period applicable pursuant to article 13. If a notified state finds that implementation of the planned measures would be documented explanation setting forth the reasons for the finding.

Article 17: Consultations and Negotiations Concerning Planned Measures

1. If a communication is made under article 15 that implementation of the planned measures would be inconsistent with the provisions of articles 5 or 7, the notifying State and the State making the communication shall enter

into consultations and , if necessary negotiations with a view to arriving at an equitable resolution of the situation.

PART IV. PROTECTION, PRESERVATION AND MANAGEMENT

Article 20: Protection and preservation of Ecosystems

Watercourse States shall, individually and where appropriate, jointly, protect and preserve the ecosystems of international watercourses.

Article 21: Prevention, Reduction and Control of Pollution

1. For the purpose of this article, "pollution of an international watercourse" means any detrimental alteration in the composition or quality of the waters of an international watercourse which results directly or indirectly from human conduct.

Article 24: Management

1. Watercourse States shall, at the request of any of them, enter into consultations concerning the management of an international watercourse, which may include the establishment of a joint management mechanism.

2. For the purposes of this article, "management" refers, in particular, to:

(a) Planning the sustainable development of an international watercourse and providing for the implementation of any plans adopted; and

(b) Otherwise promoting the rational and optimal utilization, protection and control of the watercourse.

(B). INTERNATIONAL WATER TREATIES

6.3: WATER TREATIES ON EUROPEAN CONTINENT

Europe was the first continent which witnessed sharp differences over the sharing of waters of international rivers as the thrust for harnessing water for industrial and economic development in the 19^{th} century gained momentum. In most case these disagreements were solved through negotiations. The agreement between Turkey and Austria in 1619 over Danube River and between Germany and France in1697 over Rhine were among the early landmarks in the making of modern International Law on navigation (Berghese, 1990: 307). Much later, in 19th century two commissions were setup-the European Commission on the Danube and the Central Commission on the Rhine-to regulate navigation on these two rivers (Basset, 1932: 628). The Rhine and Danube Commission were primarily administrative bodies related with navigation issues.

In 1916, Holland, affronted with the final act of the Congress of Vienna, strived in the name of its sovereignty to render delusory the rights of the riparian states of the Rhine. Between 1816 and 1956, Germany concluded approximately twenty water treaties with its neighbours. The principle that was recognized in all these treaties was that no state may take measures on its own territory concerning an international water course which will affect the flow of water in the territory of another state to the disadvantage of the latter. This rule has come to be recognized in International Law (Berber, 1959: 140). For instance, article 21 of the treaty between Germany and Czechoslovakia regarding frontier waters stated that if an installation is likely to cause any considerable or permanent change in the flow of a frontier water course or stream intersected by the frontier, each of the two states shall take account of the legitimate claims of the intersected parties in the other state (League of Nation Treaty, Vol 109: 219). Similar provisions are to be found in the treaties between Germany and France, and the Grand duchy of Luxembourg, relating the Upper Rhine and the Moselle respectively (Berber, 1959: 75). Similar principles came into the Berne Convention of October 4, 1913, between France and Switzerland. Article 4 provides that the dam to be constructed would operate in accordance with "a set of rules agreed between the two government with a view to avoiding any risk of floods and any damage to the plant upstream, and so far as possible, mitigating down stream the detriment which may result from the changes in the water flow" (Smith, 1931: 178).

The Principle of limited territorial sovereignty is to be found in the convention between France and Italy of December 17, 1914. In Articles 1, and 3 of that treaty, both parties declare that they will avoid using or allowing the exploitation of the Raya river and its tributaries in the sections only under their jurisdiction unless prior concurrence in given.

From the foregoing analysis of some of the European water treaties are important principle becomes apparent i.e., each state possesses rights of sovereignty. However this right is limited by a second consideration which is the duty not to injure the rights of the co-riparian state (British & Foreign State paper, Vol. 108: 487).

6.4: THE AMERICAN CONTINENT

The American Continent too witnessed sharp disagreement over the sharing of river waters in the 18th and 19 centuries. The treaties signed on the European Continent at times provided the basis for cooperative action with regard to allocation of river waters. However in some cases the situation demanded a completely new set of ideas and rules which had to take into account the particularities of a specific situation.

For instance, the Jay treaty of 1794, concluded between Great Britain and the United States in connection with navigation of boundary waters is an important landmark in the evolution of international rules regarding water rights. It was mutually agreed, that "both parties living on both side of the boundary should be free at all times to pass and repass by land or inland navigation into respective territory of each country; to navigative all the lakes, rivers, and water thereof, and freely to carry on trade on trade and commerce with each other (Bloomfield and Fitzgerald, 1958:2-3). A return to the North American scan shows united attempts to develop machinery for the settlements of boundary water problems.

Another milestone in the evolution of International River Law is the treaty of Washington signed between United States and Mexico in 1906. In 1894 a dispute started as a result of the change in the course of the Rio-Grande in the United States to the detriment of Mexico's interest in the river. The Mexican Government protested against the injury caused to its existing interest claiming that, the principles of International law would from a sufficient basis for the rights of the Mexican inhabitants of the bank of the Rio-Grande (Griffith L. William, 1959:3). During the late 19th century and the early 20th century demands upon the waters of the Rio-Grande were increasing and friction between the United State and Mexico over the control of the river waters gathered momentum (United States treaty Series, No.455: 23).

Negotiations between US and Mexico ultimately culminated the treaty of water. The United States renounced de-facto, if not demure the principle of absolute sovereignties (Sevett, 1952: 114). The convention of May 21, 1906 provided that Mexico would receive a limited a quantity of water from the Rio-Grande. Article 4 of this treaty makes it clear, however that the supply of water to Mexico "should not be construed as recognition by the United States of any claim on the part of Mexico to the said waters" (Saliba, 1968: 52).

The US shares waters and shares longer boundaries related to water with Canadian. The two were at loggerhead for some time over the issue of water rights. In most case, the United State, being the riparian state, defended its case by invoking the principle of absolute territorial sovereignty, although Canada as the lower riparian state, upheld the principal of territorial integrity, where by restriction are placed on another states right to change the natural flow of international waterway without perior occurrence. As a matter of fact, Canada explained the United States attitude as contrary to international law (Chacko, 1932: 74-75; Gibbans, 1929: 8-9). An important boundary waters treaty was signed between them in 1889. The treaty defines boundary water in its preliminary article as:

"The waters from main shore to main shore of the lakes and rivers and connecting waterways, or the portion thereof along which the International boundary between the United States and the Dominion of Canada passes including all bays, arms and inlets thereof, but not including tributary water which in their natural channels would flow into such lakes, rivers and waterways, or water rivers flowing across the boundary" (Bloomfield , 1958: 17).

An International Joint Commission (IJC) was set up in 1909 under the provisions of this treaty to resolve disputes relating to both boundary and transboundary waters. The boundary water treaty and IJC dealt the matter on diversion of flows for irrigation purposes and power generation as well as, reduction of municipal and industrial waste discharge, sharing water costs and benefits concerning the water issues (Mackay, 1928: 293).

The Columbia River, with originates in Canada and which flows into the United States, has been the scene of large scale of hydroelectric generation and irrigation development. The International Joint Commission established technical studies and on the basis of this was able to draw up plans for the development of the river on cooperative basins. The commission also, at the request of the two governments, submitted a report relating to the principles to be applied in determining the allocations of benefit and the distribution of costs which would result from co-operative development of the Columbia basin. The Columbia River treaty is an example of an effective use of the federal approach in context of International basin development and settlement of water dispute. Under the federal approach crucial and divisive problems can be solved with mutually satisfactory results (Martin, 1963: 71).

6.5: AFRO-ASIAN CONTINENT

International water treaties in the Afro-Asian continent are of relatively recent origin and the earliest treaty that was concluded in this part of the world was signed in 1929 between Egypt and United Kingdom. This treaty was in connection with the diversion of the waters of the Nile River in equal proportion. The British Government suggested that it should be based on following considerations: the legal principle is that the waters of Nile river, the combined flow of white and Blue Nile and their branches should be accepted as a single unit, planned for the use of people inhabiting their banks according to their needs and capacity to benefit from the Nile (Saliba, 1968: 56-57).

In November 1956 an agreement was signed between United Arab Republic and Sudan in the context of the Nile river waters. The main intention of this treaty was that water must be used according to actual need and for the purpose of development. The treaty assigned an estimated 555,000 million cubic meter of waters per year to Egypt and 18,500 million cubic meter to the Sudan. The treaty also provides for the creation of a Permanent Joint technical Commission for the planning of Nile River as single hydrological unit to be developed on the basis of mutual benefit for all riparian states. At present, the 1959 Nile agreement will continue to be the principal regulatory instrument for managing waters of Nile river (Naff & Maston: 149).

6.6: THE INDUS RIVER BASIN AGREEMENT

In 1939 a controversy arose between the province of Sind and province of Punjab as result of the diversions of the Indus River. Sir Bengal Rao headed a commission which was established to look into and to make recommendation towards its settlement.

Just after the partition of India, a conflict arose between India and Pakistan regarding the water allocation of Indus basin. A treaty was concluded between these two counties on May 4, 1948 for the utilization of waters of Indus basin. This treaty which was signed with the aid and advice of the international Bank of Reconstruction and Development laid down the following rules.

The Western river Indus, Jhelum and Cheneb and its waters area exclusively useful for the development Pakistani territory, except the Jhelum's flow in Kashmir which is significant for the development of Kashmir.

In the case of the eastern rivers Rabi Beas, and Sutlej India would utilize their waters except for a specified transition period during which India would partially supply waters to Pakistan. Each country would construct the works located on its own territories which are planned for the development of supplies (United Nations Treaty, 1942: 54).

The cost of such works would be born by the country to be benefited thereby. An appropriate procedure would be established for adjusting or arbitrating dispute related to allocation of cost under this principle (Quoted in Berber: 106). Per management Indus Commission was set up to settle the dispute over water as the provisions of the treaty.

6.7: THE GANGES WATER AGREEMENT

The Ganges water Agreement was signed on November 5, 1977 over the sharing of Ganges waters at Farakka. Its aim was also to find a long term solution for augmentation of the dry season flows of Ganges. Bangladesh and India visualized divergent solution as to how to increase the dry season flow of Ganges River. The proposal of India was transfer of water from the Brahmaputra River in Assam through a long canal passing through Bangladesh. On the other hand Bangladesh proposed storage dams in the upper reaches of the Ganges River in Nepal and India that would store wet season flow for release during the low flow period. Bangladesh was unwilling to permit the country's second major river to fall under the physical control of India, which the diversion structures at Jhogighopa and the outfall at Farakka would involve. Official, Bangladesh has rejected the link canal proposal as technically and economically unfeasible and ecologically ruinous. The Ganges water agreement of 1977, nevertheless, has provided a solid foundation for a durable settlement to be reached. Pending a permanent settlement the agreement of 1977 can be beneficial for the existing dry season flows (Falkenmark, 1986: 93-94).

(C). INTERNATIONAL WATER TREATIES IN WEST ASIA

In the West Asia today, five elements of water legislation are discernible and they are based upon:

1) Local customs, based in part on legal principles perhaps dating back to earlier antiquity, which may still dominate the water relationships in many parts of the areas.

2) Principles of religious law often provide a theoretical super-structure which has an independent legal existence overshadowed by ancient customs, on the one hand, and more recent legislation on the other.

3) Ottoman law which has survived in many parts of the West Asia and remains an important factor for water laws.

4) The Independent states of the region which have also passed more recent legislation, some of it enacted after these states attained independence (Hirsch, 1956: 147).

According to *Ergil* (1991), Arab countries do not like to be dependent on another power, especially about water which appears to be very important from a socio-psychological point of view. Turkey's Southern neighbours both see the Euphrates-Tigris as the waters of a common basin and, as countries of this basin, they wish to use these waters and share them according to their needs. Current international law given the right of ownership of waters flowing within the borders of a country to that country but, while implementing this, it adds a principle that one should not cause any loss to create a disadvantageous situation for another country. In this case, the country of origin, Turkey, has certain advantages and international law gives certain rights to the first country in the chain as owner of the water (Ergil, 1991: 52). Both Syria and Iraq, thus are demanding extra water from Turkey, but are not renovating their irrigation systems, improving watering techniques nor adopting water saving methods. It is therefore not reasonable for Turkey to respond to their southern neighbours demands which could be interpreted as "we need this much water therefore turkey ought to share it with us according to our needs alone".

The Turkish government insists that its southern neighbours use available water with minimum waste and then come forth with realistic demands for more water if it is needed (Ergil, 1991: 55).

The Euphrates and Tigris are not international waters, and nobody had any claims on resources within Turkish boundaries" (Tekeli, 1990: 211). According to *Ferruk Amik*, the Turkish director general of the state Hydraulic Works (DSI): "Syria and Iraq insist on their right to share the water. We reject this term of 'share'. It is a Turkish river so we are not required to share any of the water" (Frankel, 1991: 292).

Turkey differentiates between the notions of "International Waters" and "transboundary flows" declaring GAP Rivers as "transboundary". This Turkish approach is based on two assumptions;

1) Turkey distinguishes between "International and transboundary" watercourse in the following ways. An international watercourse has its opposing banks under sovereignty of different countries and such waters are shared by the riparian states through the "median line", while a transboundary watercourses crosses common political borders.

2) The Euphrates-Tigris rivers must be considered as one transboundary watercourse system, since they are linked by the Tharthaz canal before

merging as Shatt al-Arab, allowing the substitution Tigris waters for demands from the Euphrates (Tekeli, 1990: 213).

Another Turkish argument, according to Inan, is based on the length of the Euphrates River in each basin state, the area of the drainage basin and the contribution of water. Turkey contributes 89 percent of the annual flow of the Euphrates and Syria contributes only 11 percent of this flow. Since 1987 Turkey has delivered 500m^3/ sec which are more than 50 percent of the water. In other words, Turkey has agreed to leave more water for the down stream states than they contribute to the system. On the other hand when this whole project came into force, Turkey left two thirds of the annual flow of the Euphrates and Tigris waters which was sufficient for both Syria and Iraq. These rivers have to be considered as falling from a single basin. Prior to the Gulf crisis Iraq was selling some of this water to Kuwait. By 1992 Turkey consumed only 1.5 percent the flow but when the GAP project is completed, Turkey will consume about one third of the whole consumption. Turkey's contribution to both rivers is 19 billion cubic meter per year from the Euphrates basin, which amounts to 49 billion cubic meter per year. Turkey is going to consume one third of this 18 billion cubic meter per year, 36 billion cubic meter per year of water will be allocated to the lower riparian states, but only if they accept the equitable principles which were requested in the draft articles of the International Law Commissions.

"The Turkish principle of equity relates to actual needs. Syria indicates a need of 13 billion cubic meters per year. According to European publications its actual need is only 8 billion m^3. Iraq demands 26 billion cubic meters of waters and this means that it is claiming more than it needs. If modern techniques are used, Iranians Syrian demands for water will decrease. Turkey insists on considering both the Euphrates-Tigris basins as a whole. They both originate from Turkey which makes the greatest contribution to them. The water from the Euphrates-Tigris should be more than sufficient for Iraq1 especially after constructing the Tharthar project which links Euphrates-Tigris river" (Inan, 1992: 30).

Treaties regarding international rivers in West Asia have been patterned on the lines of American and European water treaties. The earliest treaty on West Asian water resources was concluded in December 1920 between France and Britain involving the Euphrates-Tigris, Jordan and the Yarmuk rivers. The treaty the practice where the vested as well as reserved rights of riparian states were protected. Under Article 3 of the treaty two contracting parties would agree to nominate a commission to examine a plan of irrigation organized by the government of the French mandatory, territory the execution of which would be of a nature to diminish in any considerable degree of the Tigris and Euphrates water at the point where they enter the British mandate in Mesopotamia" (Saliba, 1968: 60). Article 8 of the same treaty further has become essential for the agreement that a second commission was to be appointed to invigilate uncommon the employment, for the irrigation purposes and the production of hydroelectric power, of the waters of the upper Jordan and the Yarmuk and its tributaries, after satisfaction of the needs of the territory under the French mandatory power.

In 1921, the Treaty of Friendship was concluded between Persia and Russia. The two countries state that "they shall have equal rights of usage over the Atrak River and other frontier river and Waterways" (United Nations Treaty, vol.9:401). An important West Asia treaty was signed between the United Kingdom and France on February 3, 1922 in connection with the utilization of the Yarmuk waters proportionately. This treaty recommended that the "inhabitants of Syria and Lebanon shall have the same fishing and navigation rights on Lake Huleh and Tiberias and the river Jordan as the people of Palestine ((United Nations Treaty, Vol.9: 401).

The Final protocol of the Franco-Turkish delimitation commission, May 3, 1930, recommended that: "where as its neighborhood on the Tigris imposes on the riparian states specific obligations, it becomes necessary to establish rules in connection with the rights of each sovereign state in its context with the other". All questions, for example-navigation, fishing, industrial and agricultural utilization of the waters, and the policing of the river shall, be solved on the lines of complete equality ((United Nations Treaty, Vol.37: 207-291). Internationally the general rule for Boundary River is that the boundary follows the thatweg. It is considered to assure access to navigation to both countries. In the case of the Shatt, however, Iraq can make a compelling appeal to equitable considerations of the sort often in deciding marine boundaries (Naff & Maston, 1990: 178).

On March 29, 1946 the Treaty of Friendship and Good neighbourly Relation was concluded between Iraq and Turkey. It declared that both countries have importance of conservation works on the Tigris and Euphrates with it branches, in order to insure that flow of the two rivers with a view to avoid the danger of floods during the annual periods of high water ((United Nations Treaty, Vol.84: 24). The treaty has significance for cooperation on the part of both countries on matters in the light of the exchange of information on the water-flow records and other data of the two rivers. Turkey moreover, agreed to grant Iraq the right to construct dams and other similar works on sites which are located in Turkish territory with the stipulation that Iraq will defray the cost of the constructions. Article 4 of the treaty stated that the above mentioned work shall be the subject of a separate agreement in respect of its site, cost operation and maintenance, and its use by Turkey for purposes of irrigation and power production. Under Article 5, turkey agreed to keep Iraq informed of plans for the construction of conservation works on either of the two rivers or tributaries. On June 4, 1953, Syria and Jordan signed a treaty concerning the joint development and utilization of the Yarmuk River (Saliba, 1968: 61). On July 6, 1987 an agreement was signed on economic cooperation between Turkey and Syria. Turkey was infavour of ad-hoc bilateral joint ventures in water and energy development and was prepared to cooperate on data management (Beschorner, 1992-93: 273).

Following, in Chronological order, is a review of the international instruments governing the uses and the sharing of Nile waters. They are eight all in all, but are important at the outset to shed some light and make a few points of clarification as to the signatories and the nature of those treaties.

The first six agreements, ending with the 1929 Agreement, have to do with the territorial status of the contracting parties. It is an agreed principle of international law that such territorial status agreements constitute an obligation and a limitation on the contracting parties' territory, unaffected by a change of sovereignty.

The following treaties and instruments which govern and regulate the juridical status of an international river, the Nile, do not contain any exceptional or illegal principle. Rather, they merely confirm the principles already accepted by international jurisprudence and international norms, as well as the historical acquired rights which Egypt or some other country, my have attained over many thousand years of dependence on the Nile as its sole life.

1) The protocol between Great Britain and Italy of 1891, for the demarcation of their respective spheres of influence in eastern Africa. In its third article, the protocol stipulates that Italy pledges not to construct on the Atbara River any irrigation work which might significantly affect the Atbara's flow into the Nile.

2) Treaties between Great Britain and Ethiopia; and between the first and Ethiopia and Italy, relative to the frontiers between the Anglo-Egyptian Sudan, Ethiopia and Erthria, signed in Addis Ababa on May fifteenth 1902. in the third article of these treaties, Emperor Menelek second, King of Ethiopia engages himself towards great Britain not to contract or to allow to

be constructed any work across the Blue Nile, Lake Tana or the Sobat River, which could arrest the flow from their waters into the Nile, except in agreement with the Governme3nt of Great Britain and the Government of the Anglo-Egyptian Sudan.

3) Agreement between Great Britain and the Congo free state (now Zaire) signed in London on may ninth 1906 bringing modification to the Brussels agreement of may 12th 1894. in its third article the 1906 Agreement the Government of the Congo free state undertake not to construct or allow to be constructed any work on or near the Simliki or Isango rivers, which might reduce the volume of waters flowing into Lake Albert except in agreement with the government of the Anglo-Egyptian Sudan.

4) Exchange of Notes between the United Kingdom and Italy in December 1925, wherein the Italian Government recognize the previously acquired hydrolic rights of Egypt and the Sudan in the waters of the Blue and White Niles, and engage themselves towards the other contracting parties not to construct on the head waters of the Blue Nile or the White Nile or their tributaries and affluent, any work which might substantially modify their flow into the main river.

5) Agreement between Egypt and Great Britain signed in 1929. this treaty stipulates that no work of any kind may be undertaken on the Nile, its tributaries or on the lakes which from its source, without Egypt's consent; and in particular if these works are related to irrigation or power generation, or if they affect the volume of waters which reach Egypt, or in any other way be detrimental to Egypt.

6) Exchange of notes between Egypt and Great Britain the period from July 1952 to January 1953, regarding Egypt's participation in the construction of the Owen dam for the generation of hydro-electric power in Uganda. It was agreed to heighten the Owen dam so as to raise the water level in Lake Victoria. Compensations were agreed upon for Uganda whose lands would

be detrimentally affected by the rise of the water level in Lake Victoria (Howell & Allan, 1990: 224-230).

Nile states may have different views of what constitutes utilization in an "equitable and reasonable manner". For example, Egypt, which uses the greatest amount of Nile water, may consider its utilization equitable because it has no other source of water. In fact, Egypt argued during the Working Group negotiations that availability of other water sources should be a factor for determini8ng e3quitable utilization under article 6 (McCaffrey, 1996: 100). Although the Working Group did not entirely accept Egypt's suggestion, it did include "the availability of alternatives, of comparable value, to a particular planned and existing use" as a factor in Article 6. Egypt also might consider its use equitable because it was the first to make use of the Nile waters. It could use the "existing or potential use" factor to support that argument. In addition, Egypt might argue that "the population dependent on the watercourse" factor weighs in favor of protecting uses that its population has been dependent on over time. Finally, it could argue that it is using water equitably because it has advanced systems for "conservation" and "economy of use" (UN Watercourses Convention, May 1997Art. 6: 31).

Ethiopia, on the other, may have a different view of what constitutes equitable use. Because its territory contributes eighty-four percent of the Nile flow, Ethiopia may believe that it is entitled to a greater share of Nile waters. The contribution of water from each watercourse state, however, is not a relevant factor for determining equitable utilization under Article 6 of the Convention. At the Working Group level, India sought to include this as a factor in the Convention, but the Working group declined to include it in Article 6 ((McCaffrey, 1996: 100). Ethiopia, however, could argue under Article 6(a) that its significant contribution must be considered as a "relevant" "hydrographic" or "hydrological" factor. In addition, other Article 6 factors weigh in Ethiopia's favor. Ethiopia could argue that it is entitled to an amount of water equitable for "the population dependent on the watercourse". In addition, the second Article 6 factor, "the social and economic needs of the watercourse states concerned," is favorable to Ethiopia and all Nile states that have a lower per capita income than Egypt; (U.N.Wtercourses Convention, May, 1997: 67) half of the Nile states are among the ten poorest countries in the world (Nile Basin Initiative,, 1998: 2-10). Due to aridity, Ethiopia, just like Egypt, experiences a lack of "availability of alternatives, of comparable value, to a particular planned or existing use". In addition, Ethiopia could argue under Article 6(d) that "the effects" of Egypt's "use" on the amount of water that Ethiopia may use is inequitable. Thus, Egypt and Ethiopia could use the Article 6 factors to come to different results on equitable utilization.

Article 6(g) also implies that the uses of different countries must be compared to determine equitable use. Thus, the "availability of alternatives, of comparable value" to water-intensive Egyptian agricultural projects near the Red Sea could be compared to the "availability of alternatives" to withdrawal for Ethiopian drinking w2ater needs. This factor seems to weigh in favor of Ethiopia with respect to equity. "Comparable value," however, is an ambiguous term, and thus Egypt could argue that it has no other projects available of "comparable value". The Convention does not specify how this term should be used. Thus, as with the other Article 6 factors, the same factor easily can be formulated to support either side in the same debate. Disputes over the application of Article 5 and 6 are supposed to be answered under the Convention's dispute settlement provisions, but such a process could be cumbersome. Because it is so difficult to determine how to apply the factor of Article6, they should just be used as considerations in the negotiation of a Nile agreement, but not as a particular test for equitable utilization by Nile states (U.N. Watercourses Convention, May, 1997: 34).

It is obvious that International water treaties in West Asia are few even the one's that have been signed are of a general nature. Many questions still remain unanswerable and there seems to very little effort to deal with contentious issues. Do upstream state within which a river originates, have priority over down stream states? Do population growth and other needs in one riparian state it priority over another? Should a riparian state be demanded to consume water in more economical ways? Should it be demanded if one riparian state to use only certain sources of waters and leave specific sources for supplying the needs of other? These and related question are as yet unanswered in the region and there is very little by way of international water treaties to serve as a guide. The lack of political understanding and intense competition for regional influence is an important factor hindering the evolution of mutually acceptable water treaties in the region. Coupled with this is fact the subject of water raises unique emotions. The result is that each country prefers to go it alone and all pragmatic solution has been sacrificed at altar of populist and sometimes grandiose schemes. It is only in the 1990's that the states in the region have shown some degree of willingness to eschew unilateral action and work out solution on a cooperative basis in the light of existing international laws and conventions (Beschorner, 1992-93: 273).

Chapter-VII

Suggestion & Conclusion

(A). SUGGESTION AND SOLUTIONS TO THE PROBLEM OF WATER SHORTAGES IN WEST ASIA

In the foregoing chapter we have seen that all the international rivers in West Asia are being intensively exploited by the residents of the region. The Jordan and the Yarmuk are used mostly by Jordan, Israel, and the Syria; the Nile is reaching the maximum in term of its use, and it is most likely that all of the plans to increase the flow of the river by development projects will not be executed in the near future for social, political, and geopolitical reasons. As for the Tigris and Euphrates, their discharge has until recently satisfied their riparian countries' needs, but owing to intensive development in Turkey and Syria it seems that within ten to fifteen years a regional water shortage will arise. Such is the case with the Orontes basin too and essentially with all the water sources in the region, including internal rivers and groundwater. The conclusion is clear: West Asia, whose population is increasing at rates higher than the global average (3 percent natural increase annually as compared with the rest of the third World, which is 2.5 percent, or doubling in 23 years), will encounter a water shortage if the irrigation methods and the present plantations continue to the employed. However, because the states of the region seem unable to accomplish this within the next two decades, they will have to search for sources of water. The danger facing the peoples of the region is that if additional water is not found their fate is liable to be famine, drought, disease, and even migration. This was the fate of Ethiopia, Somalia, the Sudan, and the Sahal sates in the 1980s.

At the end of the twentieth century human society has various means of tackling the water problem. Some of these are traditional and others are innovation. Among the former are trapping of flood water, economical irrigation methods, and saving water through choice of crops. This group may also include war and the destruction of water-holding devices in neighboring countries as a way of acquiring sources of water. The innovative methods are cloud seeding, desalination transfer of water to remote places, and transportation of water in large containers, as is done with oil. Recycling of sewage water for irrigation of crops is also a new way of obtaining water, as well as preventing pollution of groundwater.

The problem of water shortage may be approached by way of economics, which regards water as a product for which a real price must be paid. Such an approach will lead to a reduction in water use for agriculture and the transition of inhabitants from agriculture to other sectors, such as tourism, industry, and services.

A further option much discussed in international forums should be studied: cooperation among the countries of the region. Could such cooperation lead to a solution to the water problems?

Some of the above method to increase the supply of water for example, trapping of food water, cloud seeding, desalination, import of water, recycling of sewage water, war-or its alternative, international cooperation, while some reduce demand saving in water use, substitution of economic sector.

7.1: WATER IMPORT

Water may be imported in pipes from a place where it is plentiful to a place where it is lacking. In the United States, for example, the water of the Colorado River is carried by the Colorado River Aqueduct to the Los Angeles area and by the Coachella and the All-American Canal to the Imperial Valley and Los Angeles area.

Water may also be imported by sea in containers, like oil. In the following we shall examine the possibilities of implementing these methods in the West Asia.

7.2: IMPORTING WATER IN PIPES

The idea of transferring water from one country to another in the West Asia has been posited on several occasions, chiefly in the 1980s and 1990s. There were proposals to carry Nile water to the Sinai Desert, and thence to the Gaza Strip and Israel. Following the signing of the peace agreement between Egypt and Israel in 1979, leaders of the two states considered the notion. Subsequently, several specialists tried to translate it into an economic plan (Kally, 1986; Ben Shachar et al., 1989). Hardly was the ink dry on the peace documents than opposition to the ides was voiced by Ethiopia, arguing that before Nile water was removed to a different drainage basin its rights had to be considered. In Egypt, too, objections were raised to the transfer of Nile water to the Jews. In Israel there were some who argued that Israel must not be dependent on Egypt in respect of such an important resource, while others gave the pollution of Nile water as a reason not bring it to Israel. Transport of Euphrates water to Amman (Kally, 1986; al Maged, Feb, 23, 1995) and of Litani water to Israel also were considered. The latter idea was rejected several times by the Lebanese government.

7.3: THE TURKISH "PEACE PIPELINE" PLAN

The idea that won the most headlines was that of the Turkish peace pipeline. In 1986 Turkey announced its peace pipeline proposal, which was based on carrying about 6 million cubic meter of water per day about 2.2 billion cubic meters annually from Turkey to the arid states of the West Asia (Irbec, 1993; Duna, 1988 : 14-65).

The project was conceived by the Centre for International and Strategic Studies in Washington, D.C. (MEED, Mar. 26, 1988: 30). The Centre asserts that the water shortage problem will be the most serious in the region by end of the twentieth century and will lead to international conflicts.

The American company that will undertake the project claims that the price of water brought by the peace pipeline will be cheaper than the price of desalinated water in the Persian Gulf; the cost of 1 cubic meter of desalinated water in the Persian Gulf is about $5, whereas the price of a cubic meter of water brought by the peace pipeline will be only about $1.07.

The pipeline will carry the surplus water from the Seyan and Ceyan Rivers, and others in the same area, that empty into the delta at whose centre lise the city of Adana. The discharge of the two rivers, which flow down from the Taurus Mountains, is 39.17 million cubic meters daily, of which about 23 million cubic meter are used. The remainder, about 16 million cubic meters, is being offered by Turkey to West Asian region.

According to the plan, the water will be carried to the Aleppo plateau in a 9.5-12.5 mile tunnel under the Nur Mountains (Nur Dogloru) that rise between the Adana plain and the valley of the Orontes. From the Aleppo plateau the pipeline will run to the twon of Homs, where it will divide into two branches. One will continue to Damascus and Amman. Both these cities are 2,296 feet above sea level, but between them the pipeline must traverse the Irbid heights, which are lower. From Amman, the line will proceed to Madina and Mecca, and thence to the coastal towns of Jedda and Yanbu. This branch will be 1,656 miles long, and will carry 3.5 million cubic meters per day. Eleven huge pumps, requiring 500 megawatts of electricity, will propel the water.

The other branch will run from Hama southeast, cross the Syrian desert highlands in Syria and Jordan, and continue parallel to the Tapline oil pipeline, passing through Saudi Arabia, Abu Dubai, and Ras al Khayma, ending in Muscat in Oman. Along the way secondary arms will fork off: one to Kuwait City, one to the Saudi oil cities another to the town of Manama in Bahrain, and a third to the town of Doha in Qatar. This branch will be 2,438 miles long and will transport 2.5 million cubic meter of water daily. Five massive pumps, consuming 600 megawatts of electricity, will move the water.

The original plan envisaged that the first branch line would cross from Syria to Israel and the West bank, and thence to Jordan and Saudi Arabia. But a revised plan by the eight states due to participate in the enterprise excluded Israel on the grounds that the Palestinian- Israeli conflict was not yet settled, nor was there peace between Israel and its neighbours.

Owing to the dispute with regard to Israel, the Turkish government decided that when it embarked on the construction of the pipeline it would begin with the eastern branch running to the Persian Gulf. This work would take about ten years. Turkey's profits, if the price of a cubic meter of water is $1, would be about $2 billion a year. However, due to different foreign policy orientation of the states the proposed water pipelines could not be materialized.

7.4: IMPORTING WATER BY SEA

Another way to solve the water shortage in the region is to import water from-rich countries nearby, just as countries import wheat or oil.

The idea is not new, and in the 1970s agreements were signed among the Gulf States, for example, and the Philippines, on transporting oil from the Gulf to the Philippines and transporting water from the Philippines to the Gulf in tankers on the way back.

The idea arose in Israel in the 1980s, when importing water from southern Turkey was the main focus. Dozens of rivers flow from the Taurus Mountains and empty into the sea, and Turkey does not utilize their water owing to topographical factors. Former Yugoslavia, Italy, and France also have abundant water close to their coastlines, but they are further from Israel. The idea is to transport water from a river in Turkey with a large discharge—the Manavgat River opposite Cyprus—to an Israeli port in special containers built for this purpose. These containers, known as "jellyfish," are 1,968 feet long and made out of a plastic material with double walls. Each container can carry about 2 million cubic meter of water when it is sunk in the sea and is towed by a tugboat (Pope, 1990;

Libiszewski, 1995: 56-57; Schiller, 1996). Another idea is a floating "water snake," which its inventors believe is less costly than the "jellyfish" (Ha'ir, Feb.11, 1994).

Importing water raises several difficulties, economic and geopolitical. To reduce the cost of the water and its transportation, a suitable terminal must be built at the port of exit, which will include water containers and pumps to transfer the water from the river to the containers or directly into the jellyfish. In addition, a special port or installation for docking the tugboat and its containers must be built in both the exporting and importing countries and in the latter a system to direct the water from the containers to the national water system. A fleet of tugboats and jellyfish will be necessary for transporting the water. According to an initial estimate, an investment of about $200 million will be necessary: about $50 million for a terminal in the exporting country, about $100 million for a terminal in the importing country, and about $50 million for the fleet.

In sum, the idea of importing water is not feasible at present, either because there are more accessible alternative in most states of the region or because of real and imaginary geopolitical fears (Gleick, 1993).

7.5: DESALINATION

Desalination of seawater may answer the water shortage in arid and semiarid regions in the world generally and the in the West Asia specifically. This is an unlimited source: the oceans or abundant brackish water is arid regions. The know-how for desalination also exists, and today it is already possible to desalinate all kinds of existing water, albeit at a relatively high price (Gleick, 1993: 45).

Of all the desalinated water in the world, about 54 percent was treated in west Asia: about 26.8 percent in Saudi Arabia, about 10.5 percent in Kuwait, and about 10 percent in the United Arab Emirates (water International Symposium, 1990; Glick, 1993: 56).

In the remaining states of the region there are hardly any desalination plants except at Eilat and Aqaba, where water is desalinated for tourists and the urban population's needs. Israel also has experimental desalination plants in the Negev, altogether about 18.2 million cubic meters per year, or 1 percent of the country's total supply. Egypt has desalination plants in small oases and tourist sites in Sinai, for example, at Sharm al Sheikh, Dhahab, and Nuweiba (Earle, 1992: 65). In the Gulf States the cost of desalinated water is worthwhile economically. But in the other states, Syria, Jordan, Egypt, and the Palestinian entity, oil is not so cheap and the cost of water will be very expensive.

According to Israeli water Commissioner Zaslavsky, an initial investment of $600-700 million will be necessary to desalinate 250 million cubic meters per year for a period of about fifteen years. In addition, an investment of about $250 million will be required as operating expenses for the same period. Over fifteen years, therefore, about $1 billion will be necessary. For two installations, which will desalinate 500 million cubic meter of water for Jordanian, Israeli, West Bank, and Gaza needs, about $2 billion will be necessary, including $1.2-$1.4 billion of initial investment (Glickstern, 1996: 2). Hence, we also obtain figures for the price of desalinating a cubic meter of water: they generally vary in the rang of $0.75-1.00 (Eckstein el., 1994:333; Glickstern, 1996:5). The questions arising are how the no oil states in the West Asia will obtain funds for such project, and what purposes they will serve.

Yet the principal problem is not the know-how for desalination, but the ability of desalination to solve the water shortage in the region. In the Gulf States; water is only for the domestic use of the urban residents, and the total amount of desalinated water in the Persian Gulf in 1990 is enough to satisfy Egypt's needs for two week only. In Syria, Jordan, Egypt, and Israel, the water is used principally for agriculture, and for this need desalinated water is not enough. Syria needs another2 billion cubic meter of water to satisfy its requirements for one year and Egypt must have another 5-10 billion cubic meter of water to satisfy its yearly needs in this decade. No desalination plants can satisfy such great needs. In Egypt and Syria such plants will not solve the chief problem.

The requirements of Israel, Jordan, the West Bank, and the Gaza Strip are smaller. Jordan lacks 400 million cubic meters annually. In the West Bank and Gaza Strip there will be an annual shortfall of 200-400 million cubic meters. A similar quantity is lacking in Israel, not including the deficit from the groundwater aquifer. The total shortage is about 1 billion cubic meter of water annually, and this can possibly be supplied by desalination (Rogers, 1994: 306-307).

7.6: TRAPPING FLOOD WATER

This method was applied in the past and is in use at present in all the states of the West Asia. Historical examples of this method are the Nabatean water installation near Shivta, Avedat, Nitzana, and Mamshit, and the Roman water works at Tadmor (in Syria), in the Arava, the Jerusalem Hills and many other places. Among contemporary examples, in Israel for decades trapping flood water has been applied in the Judean Mountains and in the northern and central Negev (the Nahal Shikma and Yeruham Dams, and many other small Dams throughout the Negev). In Jordan attempts to trap flood water have been made in the Wadi Rum area and on the Jordan tributaries. The Syrian traps flood water all along the Yarmuk basin. Trapping flood water in arid zones in problematic as it is impossible to forecast the times or quantities of the flood. Similarly, a large part of the water seeps into the earth and some of it evaporates. Therefore, the amount of water that will be available to potential settlers in the area cannot be determined with certainty.

7.7: CLOUD SEEDING

The cloud seeding method was devised after World War II when it was realized that certain chemical substances such as silver iodide could act as catalysts for cloud accumulation. The invention seemed to herald a solution to the water shortage in arid zones. In northern Israel improvements of 10-15 percent in mean yearly precipitation have been measured, but in the southern parts of the country the methods have not shown evident gains. It is also clear that cloud seeding cannot cause rainfall when there are no clouds (Glick, 1993: 414; Ohlsson, 1995: 64).

Seeding has created international tensions with the claim that improvements in the amount of precipitation in one area are at the expense of the amount of precipitation in the neighbouring area. According to this argument it is possible, for example, that seeding clouds on the Israeli coast harms the amount of rainfall in southern Syria or northern Jordan. However, this claim has not been proven.

In sum, West Asia cannot rely on this method as a solution to its water problems.

7.8: RECYCLED WATER

As the urban population grows larger, so does the quantity of water used for demestic purpose. In 1995 about half the population of the West Asia, 100 million people, living in cities or their environs. Average annual per capita water consumption was about 50 cubic meters. A simple calculation shows that the urban population of the West Asia produces about 5 billion cubic meter of sewage water. This is a considerable amount of water, and it is likely to double in about ten years on account of expected population increase and the never ending migration to the towns.

In the West Asia, sewage water can solve the water shortage for agriculture. Purification is in any case necessary to prevent pollution of groundwater and of rivers. The only problem here is the social, religious, and psychological barrier. The solution will be the gradual introduction of the use of recycled water: first for watering lawns and ornamental plants, and ultimately for agriculture. Water used for urban and industrial purposes may be retaken almost entirely and with the correct treatment may be brought up to a purity level close to that of drinking water. Recycled water may be used in agriculture for irrigating industrial crops. High-quality recycled water may also serve for irrigating citrus groves and other orchards (Mekorot, 1991; 1996).

The big crowded cities of West Asia and the settlements on the bank of rivers must also engage urgently in treatment of sewage water. Failure to do so will result in continued penetration of sewage into rivers, polluting them and endangering all inhabitants lower down the river. In Israel, in 1990 about 270 million cubic meter of sewage water were recycled, of which about 190 million cubic meters were used. The forecast for the year 2020 is for reuse of half a billion cubic meters of sewage water. In Jordan in 1991 about 45 million cubic meters were recycled. The outlook for 2015 envisages recycling 110 million cubic meters (Shatanwi and al jayousi, 1995: 92). In Egypt, in 1995 about 3 billion cubic meters were recycled. The government's plan hopes to achieve recycling of 7-8 billion cubic meter of sewage water by 2020.

7.9: CONSERVATION OF WATER

Many ways exist for saving water, and this issue has great importance throughout the world and in the West Asia particularly. One of these ways is to reduce agriculture and to import food. For example, bananas may be imported from South America. Rice, wheat, and other cereals may be imported from other places, and thus water presently used to irrigate crops in the arid West Asia would be saved and to the direct use of the population.

Obviously, it is possible to introduce efficient and economical irrigation methods. In the large river valleys and many places in the West Asia, irrigation by flooding the fields is still practiced. This method is wasteful in the extreme, and also contributed to the considerable salinization of the land, which in turn harms the crops. This irrigation method should be stopped and replaced by more effective method such as bubble, drip, or micro spray irrigation, controlled showering, and underground watering. Growing plants in greenhouses also cuts down water loss by evaporation. Billions of cubic meters of water may be saving by these systems (Allan, 1994: 88-89).

Correct transportation too can save large amounts of water. Today in many places water is moved to open earth canals. This method results in a large loss of water by evaporation, seepage, and the growth of wild plants that use up water. The transition should be made to transportation of water in concrete canals or pipes. This step too, like the previous one noted, requires an investment of billions of dollars. But it can be carried out rapidly as it does not depend on the farmers themselves.

A further mode of saving is avoidance of growing water-excessive crops, such as cotton, bananas, sugar beet, rice, and citrus, and concentration on water-saving crops. The former type of crops may continue to be grown only if recycled water is available for their irrigation.

If West Asia states (the Sudan, Egypt, Syria, Iraq, and Turkey) make an effort to save water in the ways outlined above it should be possible to save a total of 50-60 billion cubic meter. Egypt will save one-third of the amount of water it uses, namely, about 20 billion cubic meters; a similar quantity will be solved in Iraq. In Turkey, following completion of the GAP project, it will be possible to save about 10 billion cubic meters, in Syria 2-3 billion cubic meter, in Sudan 4-10 billion cubic meter, and in Jordan smaller amounts. By these methods it will be possible to solve the problem of water throughout the West Asia, at least for another two three decades (Allan, 1994: 88-89; Eckestein, 1995: 400-467).

The steady reduction of agriculture and the number of those engaged in it, reduction of agriculture on marginal land unsuitable for irrigation, and a shift to the industry and service branches. Such a transformation is likely to lead to a significant drop in the amount of water used in the West Asia, principally water for irrigation.

Not only may irrigation water be saved, but also domestic water. This is possible, among other things, by the repair of urban water supply systems that are corroded and leaking. But it must be borne in mind that the quantities saved in this way are dwarfed by those saved from irrigation (Peres, 1993).

(B). CONCLUSION

Water is the most precious and limited natural resource in West Asia. West Asia is a developing region and water scarcity is not a new phenomenon in the arid region. While the demand for water is increasing rapidly the supply of fresh water in West Asia is limited. As a result, the situation in the region is getting worse and the shortage of water is approaching crisis level. The major rivers of the region are Jordan, Euphrates-Tigris, and the Nile.

The region may be divided into two separate units. The northern mountain zone, overlying the states of Turkey, northern Iraq, Syria and Iran which consists of lofty mountain ranges and plateaus. The Southern zone consists of plains and desert. A characteristic feature of the region is that plateaus are situated in between most of the mountains. The plateaus have an important place in the physical features of the region. The central plateau of Iran is occupied by a series of closed basin with no outward drainage of any sort. Plains and deserts are the significant Physical features of the Southern region of West Asia.

In most of the West Asian states climate is harsh and arid with scanty rainfall and very high potential of evaporation except in the coastal and mountainous regions. Cyclones come from the West, cross over the Mediterranean Sea and enter West Asia. The winter is mild, summers are warm and rainfall occurs during the winter season. Throughout the region there is an acute scarcity of water.

Most of West Asia is semi-arid or arid except the high attitude areas of the north with the location of major cities determined by access to water from rivers often flowing from mountains in remote parts of the region and even outside it. In addition agriculture and animal husbandry have traditionally been the region's basic economic activities, and population growth has been generally high. These auspects increase the pressure on limited water supply of the region. Under such conditions, socio-economic significance of water becomes inevitable. Moreover because of mistrust and suspicion peaceful management of such a vital commodity i.e. water is difficult to achieve, resulting the conflict or crisis. Western influence and international intervention are still strong and these have often been seen as the primary strategic factor behind political and military maneuvering in the region. As the water problem becomes more acute, it will surface as a domestic political issue and this domestic conflict will probably affect other issues. The surplus water of northern region is transported through very great distances into areas experiencing water scarcity by river systems and ground water reservoirs. For example, the Tigris and Euphrates Rivers transport the surplus water to the intensively arid regions of southern Iraq.

The most important characteristics of West Asia is, undoubtedly, the small amount of precipitation, and this is the limiting factor for the agricultural development of the region. Throughout most of the region rainfall occurs, mostly in the winter. Northern parts of Turkey and Iran receive precipitation round the year. In the Arabian Peninsula, southern Iran, Iraq and Egypt, the annual precipitation is less than 100 mm. West Asia become entirely dependent upon imported food, a situation from which they would prefer to be freed by means of planned agricultural development. Although agriculture continues to be the largest single user of water, the growth of domestic and industrial water consumption has increased sharply.

The move towards industrialization has enjoyed high priority in government planned expenditure in the West Asia. The problem is further exacerbated by the fact that most of the rivers of West Asia are transnational that crosses or spans an international border. Disputes over the distribution of the waters of international rivers are a frequent phenomenon and stem from efforts by riparian countries to control the natural flow of water with the help of modern technology.

The problem of water sharing arises when an upstream state claims the maximum use of water within its borders as its sovereign right. The water right assertion and attitude of an upstream state, in fact deeply influences the bilateral relations and mutual trust.

Politics and water are closely interconnected. Invariably the final decision to develop water resources schemes is very much part of a domestic political process. Hence, very few conflicts arise between political subdivisions, and if such conflicts occur, especially regarding natural resources like water, quick and convincing decisions can be made centrally.

Such international conflicts over shared water resources will continue to increase, especially since some writers have already suggested that water, rather than land, will be the major constraint or the critical factor for increasing world food production during the coming decades.

The issue of sharing of river water and problem of water shortage has become acute in the West Asia region. These problems are likely to become critical unless urgent and immediate action is taken both to increase and to conserve existing supplies of water crisis. It has arid or semi-arid climate with average annual rainfall levels of less than 250 MM/Y.

The water in West Asia dispute in West Asia relates to the sharing of the surface water of the Trans national rivers basins. The history of these disputes involves, not surprisingly, both armed conflict and peaceful negotiation. The scarcity of water in the region is aggravated due to the rapid growing population. There are number of rivers in this region that traverse international boundaries that have become a focus of interstate tensions. Among them, Jordan River Basin is the most inflammable basin that has been cause for several water conflicts till date.

The competition to control the Jordan River is intense as this is the major source of water in a water-scarce region. On the one side is Israel and on the others is number of Arab State. The political hostility between Israel and the Arab state has spilled over to the issue of sharing water so much to that waters of the Jordan have become embroiled in controversy since the establishment of the Jewish state.

The Jordan River is the third largest perennial river in West Asia. It is a multinational river. It has four riparian states: Israel, Jordan, Syria and Lebanon. The length of Jordan is 253 kilometers of which 118 kilometer is under Israeli occupied territory and the remainder in Syria, Lebanon and Jordan.

The Jordan River is a zone in the West Asia which has two kinds of very different climatic characteristics.

1. The environment shared by the riparian countries of the Jordan River experiences a sharply varying seasonal rainfall two distinct seasons predominate in the basin, a rainy period from November through March,

2. There is a marked spatial disparity in the distribution of precipitation over the basin annual precipitation ranges from less then 25mm per year in the Southern part of Israel, 1400 mm per year in the mountainous area of Lebanon and Syria.

The Jordan River consists of four principal tributaries originating in four countries. The Yarmuk is the Jordan's main tributary, its flow coming from a watershed divided between Syria and the Kingdom of Jordan, with four-fifths in Syria. The rainfall throughout the Jordan valley region is meager and highly irregular in distribution.

Facing acute water scarcity, the state of Israel ever since its establishment, has sought to acquire a major part of the water of the Jordan. Having faced perpetual hostility from its Arab states, Israel considers the control over water supply as a strategic instrument and defensive technique that greatly affects regional balance of power. Israel has persisted in her plans to divert the Jordan River out of the water and area to the Negev desert. This was the major feature of the National Water carrier Project. The first stage started almost immediately after the Armistice Agreement of 1949 and it gave partial access to the headwaters of the Jordan. After the creation of the state of Israel, the Israel government began the elaboration of a national water plan, along the lines of schemes drawn up during the Mandate.

The effect of Arab-Israeli politics on the Jordan River dispute explains only in part some of the reasons for Arab rejection of any cooperation with Israel in developing the Jordan waters. Equally important is the role played by inter-Arab politics and rivalries and the relation of the Arab refugees to the problem.

The Johnston Plan was the first attempt at drawing up a development plan for all of the Jordan River basin. Israel, Jordan and Lebanon approved of it, but Syria did not, which in turn hindered Jordan and Lebanon from endorsing it. Although the Johnston Plan was never fully implemented, owing to political disagreements the proposed allocation has served as a guideline for the affected states and, in fact, many of the principles stipulated in the plan have been followed by Israel as well as the Arab States.

The first military action of the Palestinian National Liberation Movement targeted the Israeli National Water Carrier. The project, decided in 1964, was part of a broader anti-Israeli campaign which had been provoked by Israel's announcement that the beginning of pumping into the National Water Carrier was imminent.

Israel's control of the West Bank was the most important new element introduced by the war of June 1967 into the Arab-Israel hydro-political equation. Immediately after the end of the 1967 War, Israel destroyed 140 Palestinian water pumps in the Jordan valley and made it difficult to obtain permits for new wells. After this destruction, the Israeli army declared the area in the West Bank near the Jordan River a military-security zone and thus prevented many Palestinians to get to their farm land.

Lebanon is currently diverting water from the Jordan River basin via the Wazzani springs between Lebanon and Israel. Lebanon claim that it is entitled to continue pumping water from the springs under international law, and that the diversion supplies from the Wazzani springs adversely impacts Israel's water supply, and in 2002, Israeli prime Minister Ariel Sharon announced that the Lebanon's diversion represented a Cause Belli. Needless to say, tensions are high over these waters.

The disparity between the water allocations to Jewish and Arab settlements on the West Bank is enormous. The average aggregate percapita consumption for the Jewish settlements ranges between 90-120 cubic meters, where as for Arab settlements the consumption is only 25-35 cubic meters. The frequent attempt by Israeli forces to deprive Palestinians to procure groundwater from West Bank and making attempt to empoison the water resource, has become bone of contention between them which can thwart the West Asia Peace Process in coming future.

No compressive agreement have been reached over an equitable allocation of the Jordan-Yarmuk waters, although water was vital and sometimes overriding factor in the Peace Process of the early 1990's particularly in the Declaration of principles of the Oslo Agreement of 1993. October 1994, peace treaty between Israel and Jordan, which was only formalized after the last and most contentious issue shared water-resources was agreed to, included an agreement for a Joint Water Committee to develop water resources, including two new dams, one each on the Yarmuk and the Jordan.

The bilateral talks have reached different stages as far as water is concerned. Jordan and Israel have signed a fully fledged peace treaty that contains a detailed apportionment of shared sources of water.

The United States acts as the gavel-holder for this working group, with the European Union and Japan serving as co-organizers. The group has met seven times, most recent in a 'clustered meeting with the working group on the environment in Amman in June 1995 Although all the parties have recognized that levels of water wastage in the region are high, that the supply of water does not match the ever-increasing demand and that water quality has been deteriorating, the concrete results arising from the activities of this working group have been limited.

The working group has adopted a comprehensive plan for the training of professional water personnel in the region. By June 1995, eight of the fourteen training course identified by this programme had been completed. The United Nations also organized a seminar in Geneva in December 1993 which assessed the various models for regional cooperation and management, while the United States hosted a workshop in April 1994 on weather forecasting.

Implementation proved to be slow and difficult. Still, over time, a number of the provisions of the agreement were implemented. The Joint Water Committee was set up in 1994 and started to meet regularly. In July 1995, Jordan started to store winter flows in Lake Tiberian. In May 1997, Israel agreed to provide an additional 25-30 million cubic meter per year, apparently as part of the 50 million cubic meter per year. In December 1999, the new diversion dam at Adassiya became operational.

Having noted the problematic aspects of the implementation process, it is also important to discuss the positive aspects. For example, the canal for storage of Yarmuk water from Jordan in Lake Tiberias was built quickly and was inaugurated by King Hussein at the beginning of July 1995. A part from the problems of 1999 when Israel did not want to supply Jordan with what was stipulated; there has been no problem in the transfer of water from Israel to Jordan.

The indigenous Arab population of Palestine protested this massive influx of foreigners and several times this protest this degenerated into violence. However, Arab protest had little if any impact on Jewish immigration which continued unabated. After the Second World War, Britain, unable to handle the explosive situation in Palestine decided to terminate its mandate and handover Palestine to the United Nation. The UN decided that partition of Palestine into an Arab and Jewish State was the only logical solution to the problem of Palestine. Thus State of Israel was created by the UN in June 1948.

Israel considers the control over water supply a strategic instrument and defensive technique that greatly affects regional balance of power. Predictably, Israel's policy has generated a lot of tension as the riparian states have opposed Israel's attempts to control the water of the river Jordan.

After its failure to acquire water of the Jordan in cooperation with the Arab State, it's embarked on its National Water Carrier project. A major feature of Israeli water project was in connection with irrigation of the Negev and its articulated water policy. The National Water Carrier Project was started after the armistice agreements of 1949.

In the West Asian region, the Euphrates-Tigris river basin conflict involving Turkey Syria and Iraq is considered one of the major water conflicts in the region. The Euphrates river system, where the problems of water use are at an advanced stage, exemplifies many such problems, and is a case of a resource conflict over fresh water with many associated economic and political factors involved. A dispute over fresh water resource may, for instance, spill over to political conflict or economic factors and disputes may cause the sharpening of the water conflict.

The Euphrates River is the longest river in the south western Asia with 27,000 Kilometers, and its actual volume is 35.9 Billion cubic meters. The Euphrates is fond in Turkey by two major tributaries, Murat and Karasu. These two streams join around the city of Elazig, and the river Euphrates follows southern eastern route to enter Syria at Karakamis. The semi-arid Mediterraen type zone includes those areas where there is a small winter water surplus. Such areas can be described as where there is small winter water surplus.

The diplomatic relation between Turkey and Iraq are fashioned by three principles factors:

1. The sharing of Euphrates River water.
2. Security issues problems with Kurdish minority in Northern Iraq and south eastern Turkey
3. Close commercial including a safe, continental conduit for Iraqi Oil

Of all its Muslim neighbour Syria is the one with which Turkey has coldest and tensest diplomatic relations. The main area of contention between the two states for several decades was the fate of the Alexandretta territory which was annexed to Turkey in 1931 with France's consent. Since the seventies, whoever, the issues of sharing the water of the Euphrates and the Syrian assistance to the radical anti-Turkish movements has dominated the relationship between the two states? During the middle of the eighties it was already possible to talk about a network of relations based upon water for security. Syria's support for Greek-Cyprus, did not make matter easier for the relations between the states.

Although Syria and Turkey co-operate against Iraq during the Gulf war and it appears that this co-operation reduced the mutual distrust between the states, one cannot yet identify and significant change in their relations. On the other hand a future forecast suggests Syria will need to come out of its political and economic isolation and therefore will improve its network relations.

Examining Syria and Iraq's complicated relations we can observe that although the issue of sharing the water of Euphrates brought the two states at the brinic of war in 1975 it appeasers that since then both states have avoided conflict over the water. Syria did not exploit its position as an upstream state to harm Iraq and, ever more the same subject caused Syria and Iraq to co-operate in 1990 against Turkey's development plans.

Iraq and Syria reached a crisis level over economic interests, involving such questions as the pipeline from Iraq to the Mediterranean and the division of the water from the Euphrates, and this led to the massing of military forces on the Iraqi- Syrian border. Ever after the loss of its Gulf ports at the Iran-Iraq war Iraq was able to use both the Turkish War.

Syria and Iraq fear that Turkey's use of the Euphrates waters will disrupt both their current consumption patterns and future development plans. The GAP project created anxiety among its downstream neighbours even before starting to have any kind of adverse effect. After the first crisis between Syria and Iraq in 1990, when Turkey finished construction of the Ataturk dam, the largest of the twenty-two dams proposed for the Grand Anatolia project, and interrupted the flow of the Euphrates for a month partly to fill the reservoir, the second crisis occurred. Despite an advanced warning from Turkey as well as being given more water before and after temporary cutoff river waters, created high tension over the down-stream. Syria and Iraq both protested that Turkey now possessed a water weapon that could be used against them. For one month Turkey held back the main flow of the Euphrates River, which cut the downstream flow in Syria to about a quarter of its normal rate. Syria is already desperately short of water, and much of the water for its towns, industries, and farms comes from the Euphrates. Beyond this dependence, the country has been chronically vulnerable to drought, Furthermore, Syria's population growth rate; at 3.7 percent per year is one of the highest in the world, constantly adding to the scale of Syria's demand for water. Turkey and Syria have exchanged angry threats arising from this situation. Syria has been giving sanctuary to guerilla separatists of the Kurdish workers party (the PKK), a movement that has been waging a war of insurgency against the Turkish government in eastern Anatolia.

The diplomatic meetings have been taking place among the three countries. In 1980, the Turkish-Iraqi mixed Economic commission agreed upon the formation of a joint Technical committee (JTC) to study matters relating to regional waters, in particular the Euphrates river basin. In 1983, Syria joined the meetings and from then on the JTC convened its sessions on a trilateral basis. But after sixteen technical and two ministerial meetings, the JTC tale reached a deadlock having failed even to produce an outline that might serve as a basis for a report. However, bilateral talks continued and further initiatives were put forward. In 1987, two protocols were signed simultaneously between Syria and Turkey in Damascus. The first was an agreement on economic cooperation, Article 6 of which contained commitment by Turkey to release minimum annual average of 500 cum/s from the Euphrates waters " until the ultimate allocation" of the river's waters between the three countries could be agreed upon,. The second protocol was an agreement on security cooperation. The contents of the protocol were an using the outgrowth of Turkeys pressure on Syria to end its support for PKK operations. Syria was allegedly using the PKK as a way to induce Turkey to release additional waters. Nevertheless, in October 1989, late Prime Minister Turgut Ozal indicated that Turkey might impound the river's water if Syria failed to restrain the PKK from operating within its territory. Although Ozal later withdrew this threat, the underlying tensions have been resolved, and there are currently no significant high-level talks on water sharing.

The issue of Euphrates water is also entwined with concerns about territorial integrity and relations with ethnic minorities within these countries. Consequently, although water scarcity is a source of serious tension between Syria and Turkey, and may trigger interstate violence in the future, the dispute is not a pure example of a simple-scarcity conflict. Syrian officials argue that Turkey has already used its power over the headwaters of the Euphrates for political goals and could do so again. On its part, Turkey is blaming Syria for lending support to the PKK against Turkey's national security and unity.

The ability of Turkey to shut off the flow of the Euphrates, even temporarily, was noted by political and military strategists at the beginning of the Gulf conflict. In the early days of the conflict during the crisis preceding the war, there were behind-the-scenes discussions at the United Nations about using Turkish dams on the Euphrates River to deprive Iraq of a significant fraction of its fresh water supply in response to its invasion of Kuwait. While no such action was ever taken, the threat of the "water weapon" was again a part of the diplomatic setting. Turkey has never yet used water as means of political pressure and it declined to do so during the Gulf War.

There is a link between the West Asia Peace agreement and the tension between Syria and Turkey with regard to the Euphrates River. If Syria is obliged to give up water resources on Golan, and then it will be more than ever dependent on water from the Euphrates, and might reasonably claim additional amounts.

Turkey's late president Turgut Ozal championed the concept of a "peace pipeline" that would transport water from two western Turkish rivers, the Seyhan and Ceyhan, southward to Syria, Jordan, Saudi Arabia, and the other Gulf States. At the same time the "Peace Pipeline" project has been trumpeted by the Turkish government as one of the best hopes for lasting peace in the Middle East region because if fully implemented, it could effectively end regional states' competition and anxiety over this scarce.

In 1995, a new storm over water supplies has broken out as a result of the finalization of a credit agreement for the new Birecik Dam on the Euphrates River. The dispute has led Syria to start lobbying against Turkey, not only in the Arab League, but also in Western countries. The latest broadside in the bitter war of words over Middle East water resources has come from an unlikely cross-border alliance: Two states that have had no diplomatic relations for 15 years, Syria and Iraq. These are governments in which their respective leaders hold each other in mutual contempt and the enemy of one is a close ally of the other. Nevertheless, as is not so unusual in international relations, they have somehow managed a common stand. Syria and Iraq agree absolutely only on one thing -- the threat to their future that is being posed by Turkish action to harness the resources of the Tigris and the Euphrates under the predominant control of Ankara.

As the positions of the three countries have remained essentially unchanged for years, the Turkish press assumes that the latest diplomatic fuss over the water is linked to the latest round of peace talks between Israel and Syria. The former Israeli Prime Minister, Shimon Peres, had proposed that Syria obtain water from Turkey, thereby allowing Israel to keep all the water sources that are currently under its authority today. Ankara insists categorically that the waters of the Euphrates have nothing to do with the West Asia peace process. Indeed, the 1996 agreement between Turkey and Israel represents one further aspect of the search for a new balance in the region against other neighboring countries.

In September 1998, the latest crisis between Syria and Turkey was the most serious one to date. Turkish leaders have adopted a new, harsh tone with Syria. Prime Minister Mesut Yilmaz accused Syria of being "the headquarters of terrorism in the Middle East" and reportedly warned Damascus that the Turkish Army is on standby, "awaiting orders' to attack. Ten thousand Turkish troops were moved to the Syrian border and have been prohibited from taking leave. The Turkish air force was put on red alert, and remains so at this time. Egyptian President Hosni Mubarek has spent the week of shuttling between Ankara and Damascus. Finally, the agreement reached between Syria and Turkey. Unlike previous talks between the two countries, omits the water issue from the commitments undertaking. This tendency indicates that Turkey is clearly differentiating these two issues as a matter of diplomacy, and seems successful at this point.

The Nile River is the world's longest river and the lifeblood of Eastern Africa, providing sustenance and power for hundreds of thousands of people in this politically volatile region. The Nile River is 6,825 km long, the Blue Nile flows out Lake Tana in Ethiopia, while Nile spills out of Lake Victoria over the Ripon Falls. These two rivers unite at Khartoum in the

Sudan, and flow as the main Nile to Egypt and the Mediterranean Sea. The Nile has the largest number of riparian state in the developing world and flows through some of the youngest sovereign states in the developing worlds. A considerable section of the river's course lies in Egypt and Sudan, compared with other states, such as Ethiopia. Yet Egypt and the Sudan, contribute nothing to the river water while other states, principally Ethiopia, contribute most. The Egyptian climate is arid, and the Sudan is arid and characterized by savannahs. In the other states, by contrast, the climate is tropical or Savannah and they enjoy ample rainfall. In northern Ethiopia there is a monsoon climate, but in recent years the climatic there has also become arid. The Sudan and Egypt, and recently even Ethiopia, are therefore more dependent than the others on river water.

Egypt has historical rights to use Nile water since the start of human civilization. The Sudan also has historical rights, less than Egypt but more than the upstream states, which began using Nile water only recently. The entire basin states are dependent on agriculture, which is their principal source of income. Egypt is less dependent on agriculture than the others because it has other sources of income, but it is more dependent on river water than the other.

The sharing of scarce waters is always likely to be difficult for the riparian countries concerned, especially in the Nile basin, where over 80 percent of the populations are engaged in agricultural production, and where the catchments areas suffer from periodic droughts. For example, during 1984-85 the water being stored at Lake Nasser was only 24 billion cubic meters, i.e. less than one-fifth of the reservoir's capacity. Although the situation has improved due to good rainfall since 1988, the Nile's runoff patterns have reportedly exhibited low-flow periods at the beginning of each century.

Given Egypt's almost total dependence on the Nile's water, any and all developments likely to affect the river are matters of high foreign policy concern. However, in recent years, its political domination in the basin region has been increasingly challenged by the Sudan, particularly since the advent in 1989 of the National Islamic Front.

In the Colonial period, Great Britain effectively controlled the entire Nile through its military dominance in Africa and its political control of Egypt, Sudan and the three upper riparian states on the White Nile. Colonial-era tensions carried over into the post Colonial period creating a regime in the Nile basin that was, until recently, properly characterized as one of open conflict.

Although the Nile waters Agreement reached in 1929 consisted only of an exchange of notes between the British High Commission in Cairo and the Egyptian Government, it provided for the regulation of the river until the Nile Agreement 1959. The year 1956-58 witnessed a serious dispute between Egypt and Sudan over their share of the Nile waters, and Egypt withdrew from a previous undertaking to help the Sudanese to build a reservoir at Roseires on the Blue Nile, because of their continuing objections to the construction of what became known as the Aswan High Dam.

The 1959 agreement between Egypt and the Sudan supersede that of 1929, and modified the sharing ratio. In the intervening 30 years the needs of Egypt and the Sudan for irrigation water had grown dramatically. The result was the Agreement for the Full utilization of the Nile Waters, signed on 8 November 1959. Egypt and Sudan agreed on the construction of a High Dam at Aswan in order to harness the river's water. Sudan was also to contract the Reseires Dam on the Blue Nile.

The 1959 Agreement was a success in permitting both Egypt and Sudan to carry out projects that they regarded as vital to their development, and in removing a cause of tension that had soured relations between them.

Egypt has received, although perhaps not used, more than its allotment. Nonetheless, Egypt needs more water if it is to expand its irrigated surface. If has plans to bring some 1-2 million hectares of new lands into cultivation within a decade. After the Egypt-Sudanese accord of July 1975, Egypt hoped that part of those needs would be met through the construction of the Jonglei Canal, designed to channel Nile water and reduce its evaporative losses as it passes through the Sudd Swamps of the southern Sudan. The additional water available to Egypt, with a similar amount realized for the Sudan would be 2 billion cubic meter. Civil War in the Southern the Sudan, however, forced the suspension of the project.

Egypt's relations with the Sudan deteriorated considerably after Nimeiri's outer in 1985, with Egypt strongly opposing growing demands for the 1959 agreement to be revised in order to increase the Sudan's share of Nile waters.

Ethiopia is one of the world's poorest nations and accounts for more than 75 percent of the water flowing into the Nile, but consumes less then 1 percent of the Nile's water. In 1970, when Ethiopia proposed a dam on Lake Tana to preserve some of the Blue Nile headwaters for itself, Egyptian president Anwar Sadat threatened war.

Perhaps because of their lack of progress in staking a claim to the waters of the Nile by building dams, the Ethiopians continued to make verbal assertions of their rights. At a major UN conference on water in 1977, Ethiopia stated that its policy was to seek international agreement on the use of shared rivers, a position that represented some evolution with respect to that of 1956.

Tensions increased between Egypt and Ethiopia, particularly after the Israel-Egypt peace treaty had been signed in Washington in March 1979 even though Sadat decided not to proceed with his 'water for peace' project with Israel. But the Dergue even objected to proposed transfer of water to the so-called 'new land' in the western corner of the Nile Delta, where Egypt had been hoping since 1978 to reclaim 1.26 million hectares. As a start, northern Sinai would receive 3 billion cubic meters of Nile water per year.

In 1980, Egypt announced its intention to irrigate land in Sinai with Nile water. In 1984 to resettle 1.5 million Ethiopians along the tributaries of the Nile failed due to the inadequate planning, as well as lack of economic and organizational capacities. Since them, Ethiopian and Egyptian statements on the division of the waters of the Nile have been less bellicose. President Mubarak who succeeded Sadat after his assassination in 1981, has not repeated Sadat's threats. However Egyptian Ministers continued to allude to their country's vital interest.

A rapprochement between Egypt and Ethiopia had begun after Mengistu's fall. In July 1993, the two states signed a 'Framework for General Cooperation' that included clauses relating to the Nile. The agreement safeguards Egypt's supply of Nile waters from Ethiopia by giving prominence to the principle of the avoidance of appreciable harm. The concomitant gain to Ethiopia is Egyptian cooperation in developing the Blue Nile basin for Ethiopia's benefit.

A number of treaties for management, sharing, utilization and conservation of international water resources have been codified during the past two centuries. At the turn of the twenty-first century addressing the politics of adoption is a more important priority than arguing the quality of the legal principles. International law relating to the economic uses of rivers for consumptive purposes is still in the process of development.

Law, an instrument which can be used to smooth resources, provides guidelines for ordering future conduct. Law can be determined by a court action which may set a precedent that becomes a "guideline" for future cases but many also come from legislation by an administrative body.

The Helsinki Rules and the International Law Commission draft on surface water flows places constraints on the scope of any analysis of real water using situations and especially on circumstances where waters are shared. That the Helsinki Rules and the International Law Commission draft have not been the basis of any agreement is a reflection of the lack of fit between what they address and what is important to individual riparian. International law is helpful in disputes over territory, and also in regulating procedures in areas of commerce.

In 1970, UN General Assembly on laws for international watercourses, which proposed that the Helsinki Rule be considered a model. While the UN Committee felt that the subject of international water course law was important, three reservations about the Helsinki Rule surfaced. First, the rules were formulated by a professional organization which did not represent nation-states. Secondly, some countries such as Ethiopia argued that adoption of these rules as a model could preclude new considerations about this complex issue. The third was expressed in the fact that the Helsinki Rule was based on a drainage basin approach that could be potential threat to national sovereignty.

The lower riparian states begin with a claim to the "absolute integrity" of the water course which means claiming that the upper riparian state can do nothing that affects the quantity or quality of water that flows down to the lower riparian states. The quantity of water to which each state is entitled might be defined according to some more or less objective measure of need such as historic pattern of use, population, area, arable land or the United nation's clear that each state is entitled to an 'equitable share' of the river's water.

International Law in connection with the sharing of river water resources is still in a status quo stage and a full fledged international legal regime pertaining to this can develop only with the cooperation of all riparian states. The development of water resources on a regional basis must involve relevant legislation and subsequent institutions to control that development.

The Articles of the 1997 convention are afflicted by politically determined contradictions. The role of the principles of international water law in currency at the end of the twentieth century in the West Asia river basins has been to provide conflicting legal principles are 'prior use and no harm', favour the long standing downstream user. Secondly, versions of 'sovereignty', all of which have an intuitive appeal, are favored by the upstream user and especially the new upstream user. Both sets of principle lend themselves to popular and very selective chauvinist advocacy. Thirdly the concept of 'equitable utilization', a consensus converging notion developed by the International law Association in Helsinki in 1966 has only gained support among set legal professionals and some outsider scientists. The concept was refined by those meeting at the three decade long deliberations of the United Nations International law commission. The ILC convention articles produced in May 1997 cannot be precisely defined no effectively operationalised.

The 1997 UN Convention defines an international water course as a system of surface and ground water constituting a unitary whole by virtue of their physical relationship, parts of which are situated in different states and normally flowing into a common terminus. Riparian states are expected to utilize the water course in an equitable and reasonable manner, in particular, with a view to attaining optimal and sustainable utilization. This requires taking into account:

- Geographic, hydrographic, hydrological, climatic, ecological and other natural factors;
- Social and economic needs of the riparian states concerned;
- The population dependent on the watercourse;
- The effects of the uses of one riparian states on the others;
- Existing and potential uses;
- Conservation, protection, development and economy of use and the costs of relevant measures;
- Availability of alternative.

Riparian states shall, in utilizing an international water course in their territories, take all appropriate measures to prevent causing significant harm to the other riparian states. They should cooperate with each other and exchange data and information regularly.

International water treaties on the Afro-Asian Continent are of relatively recent origin and the earliest treaty that was concluded in this part of the world was signed in 1929 between Egypt and the United Kingdom. The treaty was regarding the diversion of the waters of the Nile in equal proportion. The subsequent 1959 agreement continues to be the principal regulating instrument for managing waters of Nile River.

The agreement between Turkey and Austria in 1619 over Danube River and between Germany and France in 1697 over Rhine was among the early landmarks in the making of modern International law on navigation.

In the foregoing analysis of some of the European water treaties one important principle becomes apparent i.e., each state possesses rights of sovereignty.

An International Joint Commission (IJC) was set up in 1909 under the provisions of this treaty to resolve disputes relating to both boundary and transboundary waters. The boundary water treaty and IJC dealt the matter on diversion of flows for irrigation purposes and power generation as well as, reduction of municipal and industrial waste discharge, sharing water costs and benefits concerning the water issues. Treaties related to international rivers in West Asia have been patterned in the light of European and American water treaties.

Arab countries do not like to be dependent on another power, especially about water which appears to be very important from a socio-Psychological point of view. Turkey's Southern neighbours both Egypt Iraq see the Euphrates and the Tigris as the waters of a common basin and, as countries of this basin, they wish to use these waters and share them according to their needs. Current international law given the right of ownership pf waters flowing within the borders of a country to that country but, while implementing this, it adds a principle that one should not cause any loss to create a disadvantageous situation for another country. In this case, the country of origin Turkey has certain advantages and international law gives certain rights to the first country in the chain as owner of the water.

The earliest treaty on West Asia water resources was concluded in December 1920 between France and Britain involving the Tigris, Euphrates, Jordan and the Yarmuk Rivers.

In 1921, the Treaty of friendship was concluded between Persia and Russia. The two countries state that they shall have equal rights of usage over the Atrak River and other frontier river and waterways.

On March 29, 1946 the Treaty of Friendship and Good neighbourly Relation was concluded between Iraq and Turkey. The treaty has significance for cooperation on the part of both countries on matters in the light of the exchange of information on the water flow records and other data of the two rivers.

The International Law Commission (ILC 1997), not recognizes ILC principles that contradict its interests. It has no enthusiasm for any version of water rights that compromises the principle of prior use. Its lack of enthusiasm for the constructive concept of 'equitable utilization' is overwhelming. West Asia hydro political hegemony and non-influential West Asian states both selectively reject the well meaning principles of international water law developed by the end of the twentieth century. The rapidly developing hegemony in the Tigris-Euphrates basin, Turkey is the most trenchant in its rejection, Egypt, the hegemony in the Nile basin, is also very cool indeed on the subject of the adoption of ILC principles. Israel, alone in the region, with the economic capacity to adjust to any impacts that the 1997 ILC convention might bring abstained at the General assembly vote on 21 May 1997.

When International relations reach a stage of sufficient strength, reciprocal regard and mutually understood dependence between two or more riparian it will be possible to develop institutions that will establish rules, agreed sanctions, implementing bodies, courts and all the formal instruments required for the administration of international water law.

International Law regarding the sharing of river water resources is still in a nascent stage and a full fledged international legal regime pertaining to this issue can develop only with the cooperation of all riparian states. The development of water resources on a regional basis or state must involve relevant legislation and subsequent institutions to control that development in International Law. A distinction is drawn between national and International River. If a river passes through or along the territory of two or more states it is know as International River and governed by the rules of the international river law. If a river flows completely within territory of a single state then it is a national river.

International water treaties in the Afro-Asian continent are of relating recent origin and the earliest treaty that was concluded in this part of the world was concluded in 1929 between Egypt and the United Kingdom. This treaty was in the context of the diversion of the waters of the Nile river proportion lately among riparian states. The British Government suggested that it should be based of following consideration. The legal principle is that the waters of Nile river, the combined flow of the white and blue Nile and their branches should be accepted as a single unite, designed for the use of people inhabiting their banks according to their needs and capacity to benefit from the Nile.

Treaties regarding International River in West Asia have been patterned on the lines of European and American water treaties. The earliest treaty in this connection was following: the Franco-British convention concluded in December 1920 involving the Euphrates-Tigris, Jordan and the Yarmuk rivers: it reflects the practice where the vested as well as reserved rights of riparian states were protected. During the mandate, Britain and France adopted several agreements to regulate of International Rivers under their jurisdiction to develop upstream consumptive uses in Syria and Lebanon. They agreed to permit Palestine authorities to do work in Syria for the benefit of down stream users. The mandatory system provided legal machinery for resolving conflicts over water through bilateral consultations. In 1921 the treaty of "shall have equal rights of usage over the Atrak river frontier river and water ways". An important West Asian water treaty was signed between the United Kingdom and France on 3 February 1922 in connection with the utilization of the Yarmuk water in equal proportion. The Final Protocol of the Franco-Turkish delimitation commission, May 3, 1930 recommended that: "whereas its neighborhood on the Tigris imposes on the riparian specific obligations, it becomes necessary to establish rule regarding the rights of each sovereign states in its contexts with other water purpose".

In June 1953, Syria and Jordan signed a treaty concerning the joint development and utilization of the Yarmuk river waters. In July 1987 an economic cooperation agreement was signed between Turkey and Syria. Turkey was infavour of adhoc bilateral joint ventures in water and energy development and was prepared to cooperate on data management. It is obvious that; International water treaties in West Asia are few and even the covers that have been signed is of a general natural. Many questions still remain unanswered and these seem to be very little effort to deal with contentious issues. Do upstream states within which a river originates, leaves specific, have priority over down stream states? Do population growth and other needs in are riparian state gave it priority over another? Should a riparian state be demanded to consume water in more economical ways? Should be demanded of one riparian state to use only certain sources of water and leave specific sources for supplying the needs of other ? These and related questions are as yet unanswered in the region and there is very little by way of international water treaties regime to serve as a guide. The result is that each country prefers to go it alone and all practical considerations and pragmatics solutions have been sacrificed at alter of populist and sometimes grandiose schemes. It is only in the 1990's that the states in the region have shown some degree of willingness to eschew unilateral action and workout solutions on a cooperative basis in the light of existing unilateral laws and conventions.

From the foregoing analysis it is apparent that the instead of exploiting the river on a regional basis, each of these states has preferred to go it alone on whatever portion of the river that happens to lie within or along it borders. The result of this approach has been tragic, not only because such an approach is insufficient and uneconomical, but also and perhaps more importantly, such action has the potential of precipitation war among the sharing states of West Asia.

Water, however, has often been seen as the primary strategic factor behind the political and military maneuvering in region. Under such tensed conditions issues that might over wise be managed peacefully can always trigger extreme responses. Water conflict in West Asia has been zero sum water for one user means lack of water for the other. Factors of ideology and nationalism prevent West Asian states from cooperating with each other to alleviate the problem of water scarcity. However, in the present scenario the only remedy lies in taking a regional approach to the problem. That is, water from certain countries could be diverted to other, according to the needs. This implies tacit recognition of the legitimacy of various demands. Thus factors like population growth and other needs in one riparian should be given priority over another. At the same time a riparian should be asked to consume water in more economical ways. It should also be demanded of one riparian to use only certain sources of water leave a specific source for supplying the needs of other. Conservation measures such a reduction of water in irrigation, phasing out of water intensive crops and price increases towards real value should be taken up an endangering basis. Neither time, money nor hope should be wasted on regional water development projects. Care must to taken, however, to avoid plans that are grandiose or impossible part water development projects like the 1950's plan of Eric Johnston failed to anticipated the level of hostilities in the region. In order to avoid past mistakes future project could be financed by the international monetary fund on the condition that the granting of money depended an unanimous agreement among the all riparian states.

Each state in the West Asia is aware of a growing mismatch between population and resources, especially water. The water deficit can be attributed to a number of causes, but most frequently to misdistribution, inappropriate allocation and wastage. Existing or prospective water shortages can be seen as a threat to internal political stability of water is determined to a significant extent by government policy towards specific interest groups, particularly the agricultural sector and rural populations, and military or family client groups. Water distribution is also determined by the extent to which water-planning decisions are influenced by specific government agencies or private contractors or targeted against regime opponents. The solution to water-supply constraints depends on the ability of governments to implement such policies as water pricing and the reduction of subsidies on water, staple foods and agricultural inputs. These policies clearly have a direct impact on population needs and living standards. Adverse economic consequences of such measures which may prompt internal unrest, to varying degrees, can be mitigated depending on the scale and timing of implementation and on the extent and form of compensation. These considerations also modify competition between states and their negotiating positions.

Water-resource management is demonstrably used as an instrument of foreign policy, but it must be emphasized that water-related disputes are a consequence of, rather than a catalyst for, deteriorating relations between states. No states in the West Asia want to go to war over water, but there are real concerns over the equitability of distribution. The proximate cause of actual conflict over water would be the unilateral appropriation or diversion of a shared water course by an upstream riparian without consultation. Yet this is too simplistic a scenario and does not take into account the complex political and economic interrelationships between riparian states. Whilst military intervention can never be ruled out completely, cost is a deterring factor and there are no guarantees of achieving such objectives as the distribution of hydraulic installation and related infrastructure without serious domestic economic consequences.

Control over shared water resources will continue to be used to exert political pressure and the water factor is a useful reminder of dependency. Israel, Turkey and Egypt, however efficiently managed their national water policy, will continue to dictate the regional water agenda for the reasons states. They have little incentive to concede what they regard as a strategic asset, namely priority usage. Whatever negotiations take place, it is unlikely that this strategic advantage will be significantly modified. Willingness to negotiate does, however, influence decisions on international backing for specific projects.

The long-term cooperative development of international water resources in the West Asia thus presents the greatest challenge to policy-makers within and outside the region. There has been a significant trend towards collaboration, even though this is largely confined to technical matters: cooperation on the exchange of hydrological data, flood forecasting, and joint HEP and water-recovery ventures, for example. It is these small-scale confidence-building measures, combined with a re-evaluation of national water allocation, which are of interest to and indeed are encouraged by international financial and development institutions, possible aid donors or investors. These policies can dampen regional tension and contribute to stability. In the long term they might be extended to wider-ranging fluvial commissions or international conventions to include discussion on legal issues and possible joint ventures. These are objectives which are widely considered desirable, but they are only practicable so long as the water issue is not separated from its wider political context.

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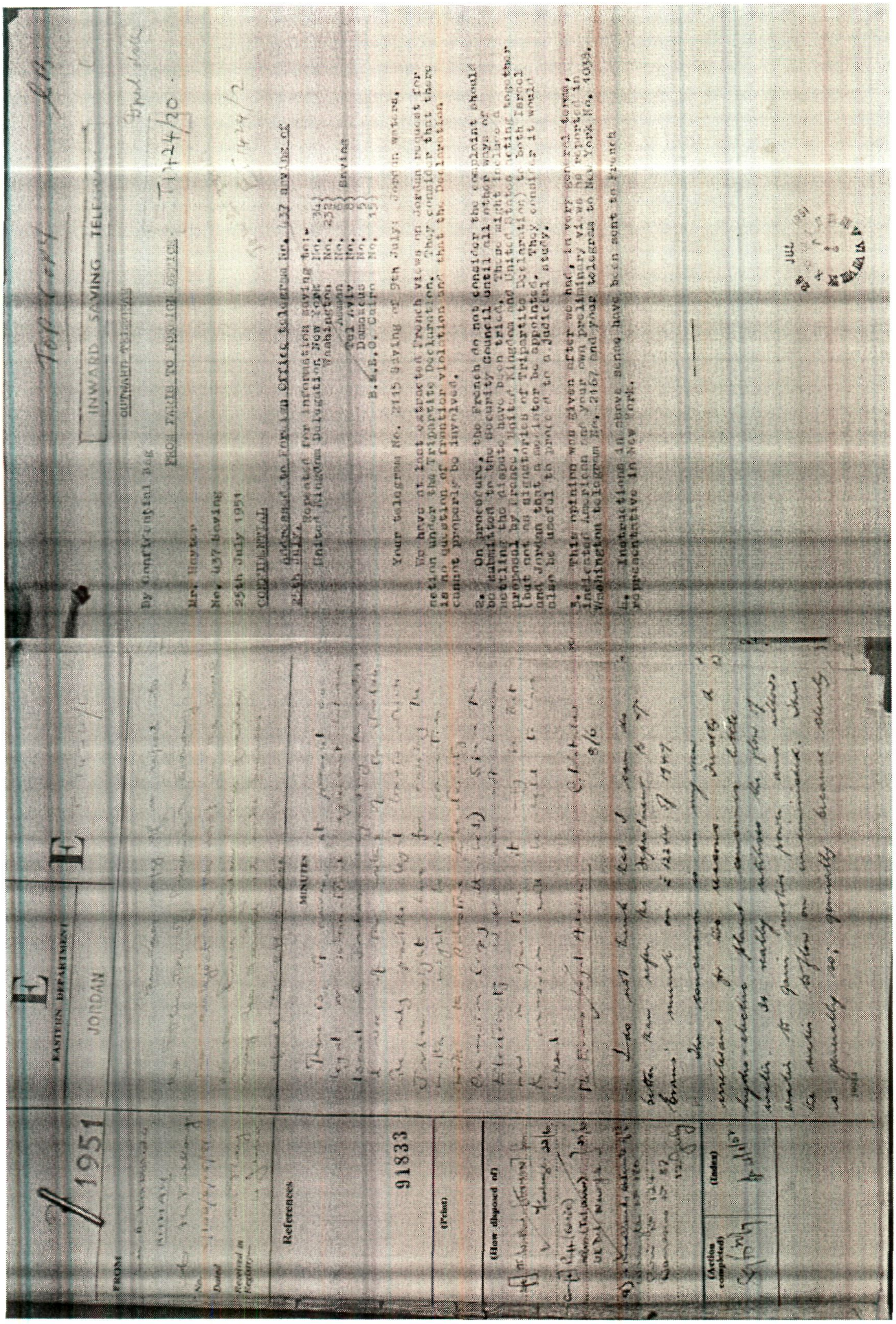
Appendices

PRIMARY SOURCE



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EASTERN DEPARTMENT
JORDAN

1951

FROM

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91833

MINUTES

I do not think that I can do better than refer the Department to Mr Evans' minute on E 12244 of 1947.

The conversion is in my view irrelevant for two reasons. Firstly a hydro-electric plant consumes little water. It really utilises the flow of water to gain motive power and allows the water to flow on undiminished. This is generally so; generally because clearly

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INWARD SAVING TELEGRAM

OUTWARD TELEGRAM

By Confidential Bag

FROM PARIS TO FOREIGN OFFICE

E 1424/20

Mr. Hayter

No. 437 Saving

25th July 1951

CONFIDENTIAL

Addressed to Foreign Office telegram No. 437 saving of 25th July.

Repeated for information saving to:-

United Kingdom Delegation New York	No. 34	Saving
Washington	No. 232	
Amman	No. 6	
Tel Aviv	No. 8	
Damascus	No. 5	
B.M.E.O. Cairo	No. 15	

Your telegram No. 2115 Saving of 9th July: Jordan waters.

We have at last extracted French views on Jordan request for action under the Tripartite Declaration. They consider that there is no question of frontier violation and that the Declaration cannot properly be involved.

2. On procedure, the French do not consider the complaint should be submitted to the Security Council until all other ways of settling the dispute have been tried. These might include a proposal by France, United Kingdom and United States acting together (but not as signatories of Tripartite Declaration) to both Israel and Jordan that a mediator be appointed. They consider it would also be useful to proceed to a judicial study.

3. This opinion was given after we had, in very general terms, indicated American and your own preliminary views as reported in Washington telegram No. 2167 and your telegram to New York No. 1038.

4. Instructions in above sense have been sent to French representative in New York.

some water will be used up for [illegible] purposes such as [illegible] this the amount will be relatively small, of course. Secondly the concession appears to be irrelevant because the Jewish action does not seem to have been taken under it or in accordance with it or for its purpose. The electricity plant is, I understand, not working. The rights under the concession were granted to a Company not to the State in which the [illegible] operates. Clause 3 of Chapter 52 (Ordinance No. 9 of 1927) also give the High Commissioner power to regulate the use of the Jordan for irrigation purposes but this power was subject to exceptions and I think would have been exercised for the benefit of the whole of Palestine and Trans-Jordan which are just now under the one authority. I should think that the Jews could not claim to use this Ordinance in such a way as to injure the interests of the communities lower down.

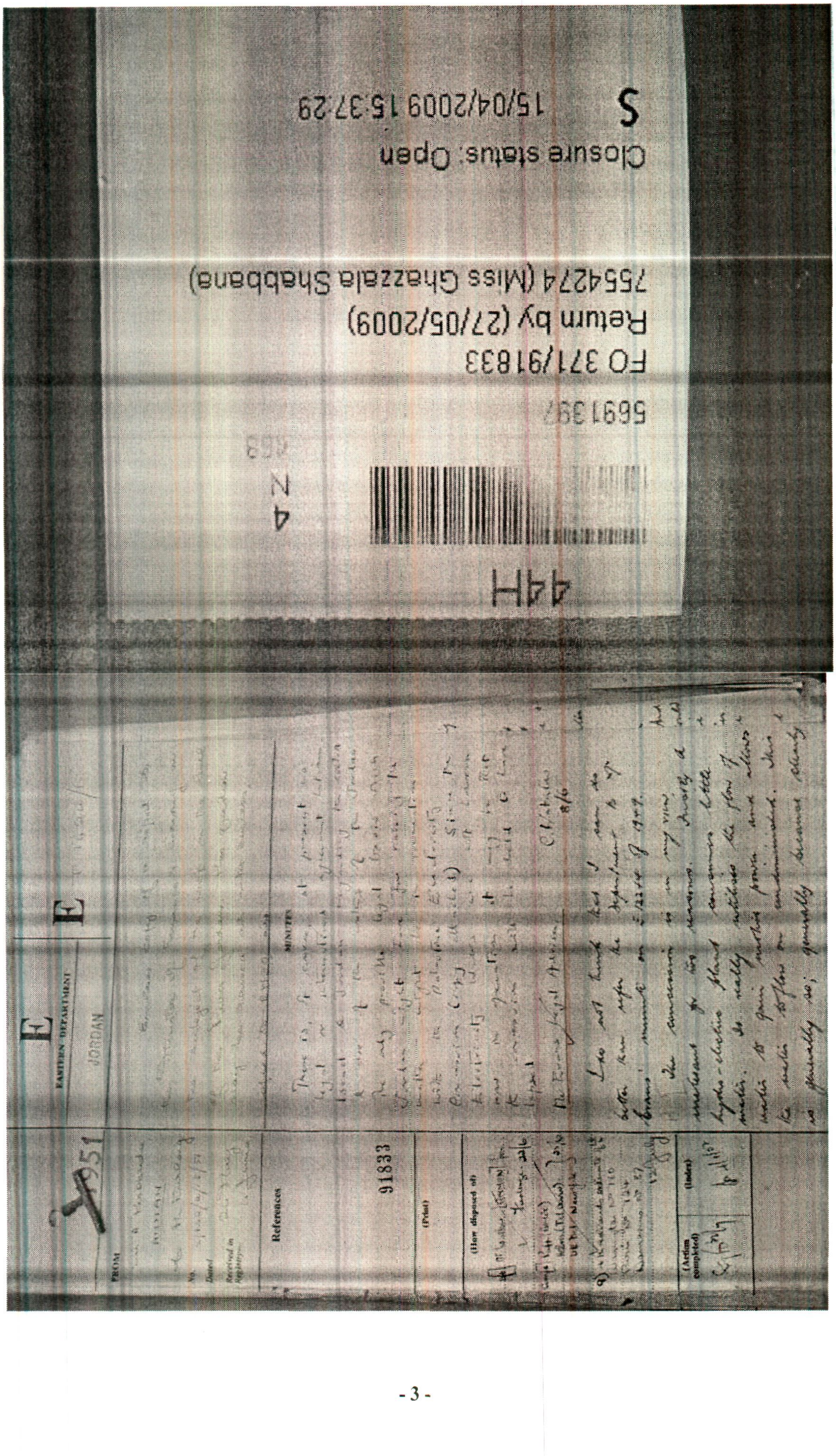
The normal rules relating to the use of non-national rivers should therefore apply.

These appear to fluctuate between claims of absolute sovereignty and claims of all riparian owners that the flow of the water in their areas shall not be disturbed. The right answer, in the present state of the law probably falls somewhere between the two extremes.

Oppenheim as Mr Evans states postulates that a riparian State must not alter the natural conditions of its own territory so as to injure that of its riparian neighbours.

Hyde does not necessarily hold to this view. He [illegible], by stating U.S. practice to be sovereignty viewpoint, (as long as the river is not navigable on the [illegible] in question. That is not the point here which merely concerning so much water and the ability to increase [illegible] its [illegible] lower down impossible economically under to present economic conditions)

The U.S. Supreme Court has however applied a principle of equitable relief also between States (of the U.S.) which recognise a right of prior appropriation. The following statement of Mr Justice Holmes is relevant: "A river is more than an amenity, it is a treasure. It offers a necessity of life that must be rationed among those who have power over it. N.Y. has the physical power to cut off all the water within its jurisdiction. But clearly the exercise of such a power to the destruction of the interest of lower States could not be tolerated. And on the other hand equally little could New Jersey be permitted to require N.Y. to give up its power altogether in order that the river might come down to it undiminished. Both States have real and substantial)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MINUTES

There is, so far as [illegible] at present no legal or international agreement between Israel & Jordan regarding the [illegible] & use of the waters of the Jordan. The only possible legal basis which Jordan might have for raising the matter might be in connection with the Palestine Electricity Concession (copy attached). Since the Electricity Works are not [illegible] [illegible] in question it may be that the concession will be held to have lapsed.

Mr Evans, Legal Adviser

C. Wakefield 8/6

I do not think that I can do better than refer the department to Mr Evans' minute on E 122[illegible] of 1949.

The concession is in my view irrelevant for two reasons. Firstly a hydro-electric plant consumes little water. It really utilises the flow of water to gain motive power and allows the water to flow on undiminished. This is generally so; generally because clearly some water will be used up for natural factory purposes such as cooling, but this amount will be relatively small, of course. Secondly the concession appears to be irrelevant because the Jewish action does not seem to have been taken under it or in accordance with it or for its purpose. The electricity plant is, I understand, not working. The rights under the concession were granted to a company not to the State in which [illegible] by [illegible]. Clause 3 of Chapter 52 (Ordinance No 9 of 1927) does give the High Commissioner power to regulate the use of the Jordan for irrigation purposes, but that power was subject to exceptions and I think would have been exercised for the benefit of the whole of Palestine and Trans-Jordan which are not now under the one authority. I should think that the Jews could not claim to use this Ordinance in such a way as to injure the interests of the communities lower down.

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NOTHING TO BE WRITTEN IN THIS MARGIN.

somewhere between the two extremes.

Oppenheim as Mr Evans states, postulates that a riparian State must not alter the natural conditions of its own territory so as to injure one of its neighbours.

Hyde does not necessarily hold to this view. He tends, by stating U.S. practice, to the sovereignty viewpoint (so long as the river is not navigable in the portion in question. That is not the point here which merely concerning so much water that the lessening in volume renders its use lower down impossible economically under present economic conditions).

The U.S. Supreme Court has, however, applied a principle of equitable relief when between States (of the US) which recognise a right of prior appropriation. The following statement of Mr Justice Holmes is relevant: "A river is more than an amenity, it is a treasure. It offers a necessity of life that must be rationed among those who have power over it. N.Y. has the physical power to cut off all the water within its jurisdiction. But clearly the exercise of such a power to the destruction of the interest of lower States could not be tolerated. And on the other hand equally little could New Jersey be permitted to require N.Y. to give up its power altogether in order that the river might come down to it undiminished. Both States have real and substantial

NOTHING TO BE WRITTEN IN THIS MARGIN.

interests in the river that must be reconciled as best they may be. The different traditions and practices in different parts of the country may lead to varying results, but the effort always is to secure an equitable apportionment without quibbling over formulas."

In 1901, Kansas v Colorado, the US Supreme Court dismissed the Kansas bill on the grounds that the benefit to Colorado was, in comparison with the minor detriment to Kansas, such that it would be inequitable to interfere. Kansas were allowed however to reopen the matter when they could show that their substantial interests were being injured "to the extent of destroying the equitable apportionment of benefits between the two States ....."

In 1911 the U.S. Supreme Court recognising that the doctrine of prior appropriation was in force in both States parties to the action nevertheless rejected the plea that a State could divert and use waters flowing within her boundaries regardless of any prejudice that this might work to others having rights in the stream below the boundary.

In 1927 the German Constitutional Court applying to some extent the principles of international law said in one part of their judgement that State A was obliged to refrain from such interference with the natural

... BE WRITTEN IN THIS MARGIN.

5. Where proposed employment threatens the lawful interests of another State the latter is justified in offering absolute opposition, but any difference as to the existence or non existence of such a vital interest shd be regarded as a justiciable dispute.

6. That technical not commissions should receive disputes as to technical disputes.

7. That where questions of usage are likely to arise frequently, permanent international commissions should be set up.

8. There is no juridical priority between navigational and other uses, but the history and circumstances of each such system maybe considered for the purpose of determining whether in any particular case the right to use waters in a particular manner has acquired by priority of time or for any other reason precedence over the claim to use it in some other manner. Disputes over such questions should be regarded as suitable for arbitration, judicial settlement or reference to the Council of the League. (or now the UN)

9. Generally it is the duty of States to refrain from unilateral action without giving other interested riparian States the opportunity to comment.

10. These principles should not ... 6.

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be understood simply as a State sovereignty is in any way curtailed or penalized, but only that in certain cases the unilateral exercise of sovereign power may be regarded as an unfriendly & improper act.

The principles enunciated by Smith may be more law as it ought to be than law as it is now.

However there are other decisions by tribunals other than the U.S. Supreme Court which have based themselves on the 'equitable apportionment of benefits' principle.

Of Smith's principles what authority there is does seem to support (1), and a combination of (2), (3), & (4) which might be expressed instead in the form of the equitable apportionment principle.

I think that what authority there is does show that a State subject to perhaps acquired prescriptive rights should not be allowed to stop or divert entirely a multi-national river. I think it follows from this that a State sh^d not in the special circumstances of this case so deplete the waters as to render use of the remainder

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unreasonable.

The rights in this particular case will depend upon the history of the river, of the use of the offending gates and its use for irrigation generally, and the possibility of reducing salinity in Jordan water by and the existence of other water supplies.

Although the law is doubtful, I am inclined to think that an international tribunal would first find that a State has no unlimited right of interference with a river flowing through its territory into the territory of another State and that there is a chance that it would support acquired rights & apply the equitable apportionment principle.

Now I have no knowledge of the course of this particular problem, i.e. whether or not Jordan has made representations to Israel, how long the present state of affairs has continued, what Israel has answered etc. But I should have thought that Jordan would be well advised to seek agreement with Israel over the use of the river for their common benefit; but, if no such agreement were forthcoming I think that the dispute is justiciable & Jordan has sufficient grounds & any reasonable ground in the authorities to refer the case to some international body. The dispute could be formulated. Of course

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Minutes.

Since the draft was prepared the Jordan Minister has spoken to Mr Furlonge, & left an aide memoire which should be added to the enclosures. I have suggested a suitable amendment to para 2.

Water rights are a subject on which Arabs are particularly sensitive, and if their representations pass unheeded & no direct pressure of any kind is brought to bear on Israel, the Jordan Govt are likely to be almost more embittered by this than by any other possible Israel action. I think we ought to ask Sir K. Helm to protest, if it is likely to influence the Israel Govt at all.

[illegible]
21 vi

A) Cutting from "Scotsman" of 18.6.51.

B) Aide-Memoire of 20.6.51.

[illegible] June 22 [illegible] to [illegible] Helm's [illegible] to Paris, Damascus & Washington. See ET 1423/12. [illegible] 7/6.

[illegible]

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sovereignty by a state within its own domain, and hence unrestricted by any limitation not self imposed." Hyde then goes on to refer to a lessening of this severe attitude of the United States in certain circumstances, and then refers to the practice of the United States Supreme Court in dealing with disputes between the component states themselves. He says: "In the course of domestic adjudications between states of the United States, the Supreme Court . . . has adopted and laid down rules permitting diversions that under the circumstances of the particular case were conceived to be equitable. . . . It has not hesitated to deny that an American Commonwealth may rightfully divert and use as she may choose the waters . . . in an inter-state stream regardless of any prejudice . . . to others having rights in the stream below her boundaries. Through Mr. Justice Holmes the Court has declared:

"The river is more than a amenity, it is a treasure. It offers a necessity of life that must be rationed among those who have power over it. New York has the physical power to cut off all the water . . . but clearly the exercise of such a power to the destruction of the interest of lower states could not be tolerated. . . . Equally little could New Jersey be permitted to require New York to give up its power . . . that the river might come down to it undiminished. . . . Both states have real and substantial interests in the river which must be reconciled as best they may. The different traditions and practices in different parts of the country may lead to varying results but the effort always is to secure an equitable apportionment without quibbling over formulas."

In applying these principles the Court has held that as between two states, both of which subscribe to the doctrine of appropriation . . . relief should be granted to prevent a diversion which would serve to injure rights acquired through a prior appropriation. Again the Court has been insistent in demanding that as a condition essential to relief a complaining state establish conclusively that appropriations for other alleged acts of interference through diversion . . . produce, in fact, obvious injuries to itself. . . . Moreover, in the course of adjudications before it the Court has weighed carefully the character of the opposing equities of the states at variance. As a tribunal possessed of sufficient jurisdiction to prevent or grant relief on account of diversions of the waters of American inter-state streams the Court . . . has not been obliged to seek light from the law of nations . . . Nevertheless, the conclusions of the Court are believed to be of utmost value in pointing to the relative strength of opposing claims of riparian states and in indicating bases of sensible agreements between them."

The decisions . . . are quoted . . . in Volume . . .

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NOTHING TO BE WRITTEN IN THIS MARGIN.

Minutes.

3. Although there is little or no international authority apart from the writings of publicists on the question of the use of rivers flowing through more than one state, it does appear possible to argue that the right of a state to use the waters of a river within its territory must not be abused. The maxim sic utere tuo ut alienum non laedas is applicable to relations of states no less than those of individuals. It would appear possible to hold that there is distinct chance that an international tribunal seized of such a case would decide the matter according to the equitable apportionment of benefits principle. It is probably impossible to expect such a tribunal to lay out a scheme of apportionment or in any way to regulate the use of a river system. This is a very technical matter which requires qualifications that most lawyers will not possess. There does not appear to be any reason, however, why a Court should not in any particular case decide that what has been done is inequitable. In the particular instance of the River Jordan the flow of water has been reduced to such an extent that the salinity has increased well above an economic margin. The case is not, therefore, so much one of mere diversion of water but of action taken by one state which virtually removes economic use of the river from the other. There appears to me to be no reason why an international tribunal should not come to this conclusion and hold such action to be wrongful.

The views of [illegible] concerning the need for agreement between the parties on a proper system of control and regulation are relevant. As there is little international authority a reference to an international tribunal must be something of a risk. Jordan would, therefore, be well advised to seek some form of agreement with Israel over the use of the Jordan River, particularly as the amount of water available in any event is scarcely enough for present irrigation. No doubt the reference to the United Nations will be designed to this end. As I have suggested, an international court, even if it found in Jordan's favour, would probably not be able to lay down any technical scheme, and the parties would, therefore, be thrown back upon the need for agreement between themselves. It seems to me that this course should be adopted from the very beginning, if the discussions in the United Nations can be led towards this objective.

D.T. Holland

(D. T. Holland)
21st June, 1951

NOTHING TO BE WRITTEN IN THIS MARGIN.

8142/2/16/51

CONFIDENTIAL

British Legation,
Amman.

24th May, 1951.

ET 1424/1

Dear Furlonge

I enclose for your information the copy of a report addressed by Walpole to the Minister of Finance and Economy on the subject of the River Jordan.

I understand that the Jordan Government are considering raising this issue at Lake Success, but they are obviously doubtful about the legal aspect of the question and of the proper manner in which to make their protest.

Do you think that we could give them some confidential advice on both fronts?

I am sending a copy of this letter to Rapp.

Yours ever
[illegible signature]

G.W.Furlonge Esq., C.M.G., O.B.E.,
Eastern Department,
Foreign Office,
London, S.W.1.

raising water on to the lands of t
settlement of Ashdot Yacov.

NOTHING TO BE WRITTEN IN THIS MARGIN.

Registry No. E 1 1423/6

Draft.

Mr. W. F. Walker, British Legation Amman.

The Jordan Ministers have now spoken to us about it, leaving an aide memoire of which a copy is enclosed

aide-memoire below.

From-
Mr. [illegible]

Copy to Brit. [illegible] & with copy to UK Del. New York, & Tel. Aviv.

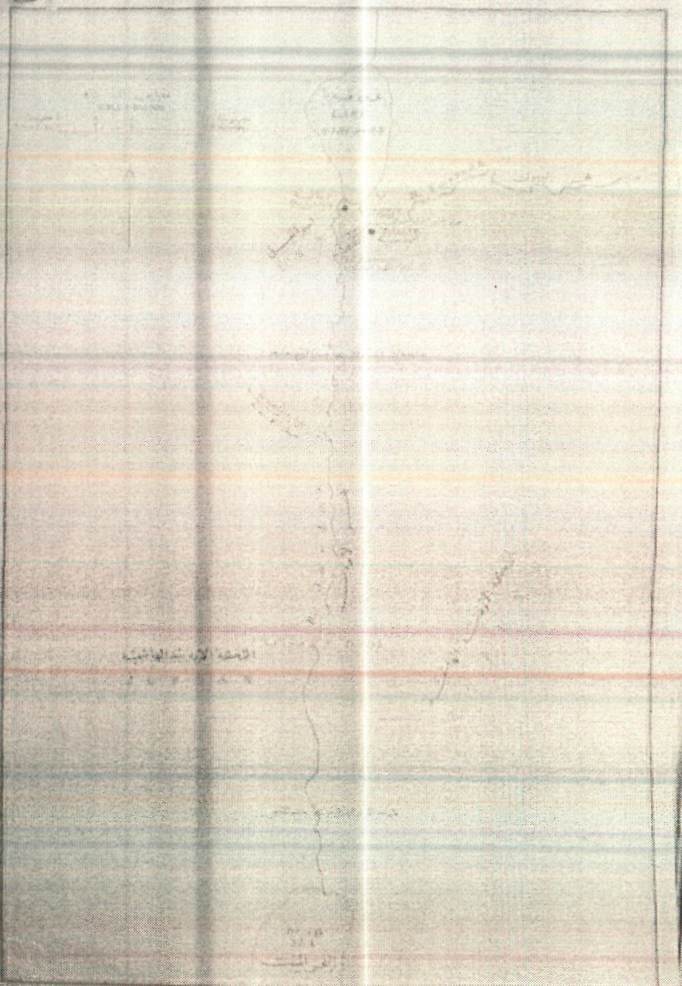
Please refer to Sir A. Kirkbride's letter E 142/2/15/51 of the 24th May [illegible] about the Israel Government's action in closing the sluice gates on Lake Tiberias and thereby causing salinity in the discharge of the Jordan lower down.

2. We now understand from the press that the Jordan Government have already sent a protest against this action to the United Nations and that protests are also being sent to the United States and French Governments and ourselves as signatories of the Tripartite Declaration. We should be glad if you could confirm whether protest has been lodged with the U.N. and if you could let us have the text of the communication.

3. Meanwhile we have consulted the Legal Adviser on the legal aspects of the case and I attach a copy of his minute. This is in rest an amplification of our letter to your Chancery No. [illegible] of December 23rd, in which we quoted the general views of the Legal Adviser on the question of the allocation of the waters of the Jordan from the point of view of International Law. You will see that although it is doubtful whether there can be considered to be any established rules of International law on the use or diversion of the waters of international rivers, there are nevertheless a considerable number of cases which serve to establish the precedent of the equitable apportionment of these waters between the various riparian states or communities. In the case of the Jordan this principle has of course already been

/expressed

Map illustrating Reservoir scheme of the Jordan



to some extent
expressed/in the Concession of the Palestine Electric Corporation, which provides that the Company shall not through its operations diminish the [illegible] of water available for irrigation and other purposes.

4. We also enclose a copy of an article by Dr. H. A. Smith, who is [illegible] recognised authority on international rivers, on the waters of the Jordan.

5. This incident is of course an example of the kind of thing which must be expected to occur so long as no understanding is reached between Israel and Jordan regarding the use of the waters of the Jordan and Yarmuk. Such an understanding is in fact essential, not only to enable the major schemes which both countries have in mind to be carried out, but to provide for the effective day to day regulation and use of the flow of the rivers. Subject to the views of the Legation at Tel Aviv, our impression is that the Israelis are unlikely to embark on the major part of the Hays Plan without obtaining the agreement of Jordan, but that until there is general agreement, they will have no scruples about taking unilateral action, to the disadvantage of Jordan in a number of smaller ways.

6. We have discussed this matter with Sir A. Kirkbride, who has confirmed again that he does not see any possibility of getting Jordan to open water negotiations with Israel even on a technical level at the present time. He considers, however, that although

/7.

It is most unlikely that U.N. will take any action on Jordan's complaint, a useful purpose will have been served in bringing the case before the United Nations public opinion, which in his view is at present hardening towards Israel.

8. I am sending a copy of this letter and enclosures to ~~[illegible]~~ Rapp and, with copies of Sir A. Kirkbride's letter and enclosures, to the United Kingdom Delegation in New York and to Helm, ~~[illegible]~~

7. If [illegible] this [illegible]

with a view to possible representations to the [illegible] Court, if those of the Jordan Company are invaded elsewhere; and should be grateful for his views on the probable effectiveness of such action.

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NOTHING TO BE WRITTEN IN THIS MARGIN.

NOTHING TO BE WRITTEN IN THIS MARGIN.

6. We have discussed this matter with Sir Alec Kirkbride, who has confirmed again that he does not see any possibility of getting Jordan to open water negotiations with Israel even on a technical level at the present time. Apart from Walpole Jordan has no water expert of sufficient callibre to meet the Israelis and it would be unfair to ask a British official to undertake the task. He considers, however, that although it is unlikely that the United Nations Organisation will take any action on Jordan's complaint, a useful purpose will have been served in bringing the case before United Nations public opinion, which in his view is at present hardening towards Israel.

7. I am sending a copy of this letter and enclosures to Rapp and, with copies of Sir Alec Kirkbride's letter and enclosures, to the United Kingdom Delegation in New York and to Helm, with a view to possible representations to the Israel Government, if those of the Jordan Government pass unheeded elsewhere; and I should be grateful for his views on the probable effectiveness of such a step.

(G. W. Furlonge)

(A)

Minutes.

E T1424/1

SCOTSMAN.

Entry
Mr Evans

Cutti[illegible] dated 18 JUN 1951 194

ALLEGED JEWISH ACTION ON JORDAN RIVER

Efforts to Divert Flow

"Daily Telegraph" and "The Scotsman" Correspondent

AMMAN, Sunday.—It has recently been discovered that the Jews are exerting efforts to divert the flow of Jordan River towards Jewish lands, thus preventing the natural course of the river from irrigating Jordonian lands.

Jordan has, therefore, protested to U.N. against the Jewish action which it termed *prejudicial to its interests* and a breach of international laws and conventions.

Similar protests have been sent to the three Powers who are signatories to the Tripartite Proclamation avowing the preservation of the *status quo* in the Middle East, namely Britain, France, and America, reminding them of their promise, and demanding the prevention of the Jews from continuing their aggression.

Left by the Jordan Minister 20/6/51 (B)

The Jewish Authorities have closed the dams at the outlet of Lake Tiberias, and thereby stopped the flow of the Jordan river in its natural channel.

This action is in direct contravention of International Law. It causes most considerable damage to the Agricultural Schemes and the schemes for housing the Refugees in the Jordan Valley in Jordan Territory, located between the Bridge of El Shikh Hussein and the Allenby Bridge.

The Jordan Government have sent protests concerning this Jewish action both to the United Nations and to the Countries signatory to the Three Power Declaration.

E T1424/1

Mr Hunter

SCOTSMAN.

Mr Evans

Cutti , dated 18 JUN 1951 ...194

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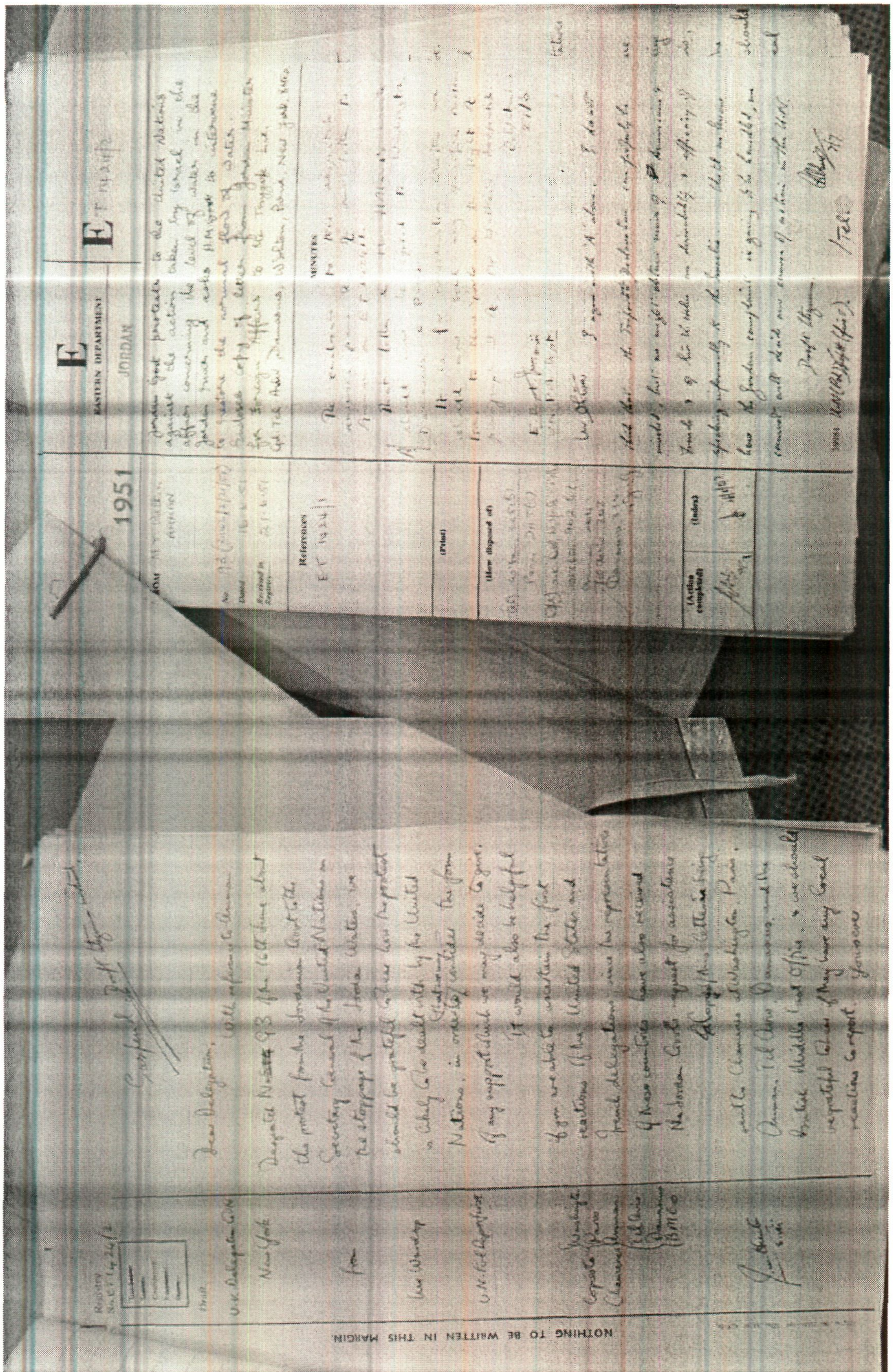
EASTERN DEPARTMENT
JORDAN
1951
MINUTES
NOTHING TO BE WRITTEN IN THIS MARGIN

COPY

His Excellency, Mr. Trygve Lie,
Secretary General, United Nations, Lake Success.

I have the honour to request Your Excellency to place on record the following complaint and protest concerning an infringement by Israeli authorities against the riparian rights of the Hashemite Kingdom of Jordan, and to take [illegible] steps to order the stoppage of this aggression.

Investigation carried out by Jordan Government experts established the fact that the Government of Israel has held up the natural flow of the River Jordan at the southern outlet of Lake Tiberias, namely at Dagania, a Jewish settlement lying in Israeli territory.

The quantity of water thus held up is estimated to be 500,000,000 cubic metres per annum, a quantity which had hitherto been used for irrigation purposes in the Jordan Valley south of Lake Tiberias in Jordan territory. The loss of this water has caused a considerable increase in the salinity of the waters of the River Jordan together with a lowering of the water level.

Seven pumps, situated immediately to the north of the Palestine Electric Corporation reservoir [illegible] part of the [illegible] Power Station, and now [illegible] by the Israelis, [illegible] the Jordan Government [illegible]. [illegible] by this [illegible] [illegible] cubic metres per annum.

The abnormal rise in the salinity [illegible] cultivators [illegible] irrigation water [illegible] on both sides of the River Jordan in Jordan territory. Salinity of the waters during the British mandatory [illegible] never exceeded 300 parts per million -- the [illegible] for [illegible] Valley soil conditions -- whereas tests carried out by Jordan Government experts during the past three months, showed this salinity to have risen to 1,100 parts per million at the Allenby Bridge on the [illegible]-Jerusalem [illegible].

This [illegible] salinity, [illegible] moreover, [illegible] precluding all [illegible] of irrigation [illegible] in the Jordan Valley.

Unless prompt action is taken to prevent this [illegible] interference by Israeli [illegible] the free flow of the River Jordan at Dagania, the general economy of [illegible] will be seriously affected, [illegible] from the river that [illegible].

I shall be grateful, therefore, [illegible] me at the earliest [illegible] take no step and [illegible] in the [illegible] violating [illegible] United Nations [illegible].

Please accept [illegible]

(Signed) [illegible]
[illegible] of Foreign Affairs.

Despatch No. 93
CONFIDENTIAL
S148/2/81/51

British Legation,
Amman.

18th June, 1951.

ET 1424/2

Sir,

With reference to Sir Alec Kirkbride's letter No. S142/2/15/51 of May 24th to Mr. Furlonge concerning the level of water in the River Jordan, I have the honour to inform you that the Jordanian Government have, without waiting for any advice that we might offer, protested officially to the United Nations against the action of Israel in this matter. A copy of the letter addressed by the Jordan Minister for Foreign Affairs to the Secretary General of the United Nations is enclosed herewith.

2. At the same time the Jordan Government have formally requested His Majesty's Government, as one of the parties to the Tripartite Declaration of May 25th 1950, to use their influence to ensure a resumption of the normal flow of water in the Jordan. Similar requests have been made to the United States and French Representatives in Amman.

3. I am sending copies of this despatch with enclosure, together with copies of the expert's report enclosed with Sir Alex Kirkbride's letter under reference, to His Majesty's Representatives at Tel Aviv, Damascus, Washington and Paris, to the Head of the United Kingdom Delegation at New York and (without the expert's report) to the Head of the British Middle East Office.

I have the honour to be,
With the highest respect, Sir,
Your most obedient,
humble servant.

M.T. Walker

(M.T. Walker)

The Right Honourable Herbert Morrison, M.P.,
Principal Secretary of State for Foreign Affairs,
The Foreign Office,
London, S.W.1.

Aviv) both on above point and on desirability and likely efficacy of making informal representations in Tel Aviv.

3. Until we know how United Nations Secretariat propose to deal with the Jordan complaint we find it difficult to determine the line to adopt at ~~Lake Success~~ Manhattan. UKDel New York will doubtless advise on this point.

9/7

Distributed to

Eastern Dept
Middle East Secretariat
United Nations Political Dept.

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Cypher/OTP AND OUTWARD SAVING TELEGRAM
By Confidential Bag DEPARTMENTAL DISTRIBUTION

FROM FOREIGN OFFICE TO WASHINGTON

E 1424/2

No. 3351 Saving
9th July, 1951.

D. 9.40 a.m. 10th July, 1951.

CONFIDENTIAL

Addressed to Washington telegram No. 3351 Saving of 9th July and Saving to Paris No. 2115
Repeated for information to Amman, Tel Aviv, and Damascus,
and Saving to United Kingdom Delegation, New York No. 817.
B.M.E.O. (Cairo) No. 962.

Amman despatch to me No. 93 [of 16th June: Jordan complaint regarding stoppage of Jordan waters].

We do not think Tripartite Declaration can properly be invoked in this case since no violation of frontiers or armistice lines is involved. Furthermore formal representations by Tripartite Powers to Israel might well be countered by objection that matter has already been referred to United Nations.

2. We should be glad to learn American/French views (and those of Tel Aviv) both on above point and on desirability and likely efficacy of making informal representations in Tel Aviv.

3. Until we know how United Nations Secretariat propose to deal with the Jordan complaint we find it difficult to determine the line to adopt at Manhattan. United Kingdom Delegation New York will doubtless advise on this point.

DISTRIBUTED TO:-

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Middle East Secretariat
United Nations Political Department

b.

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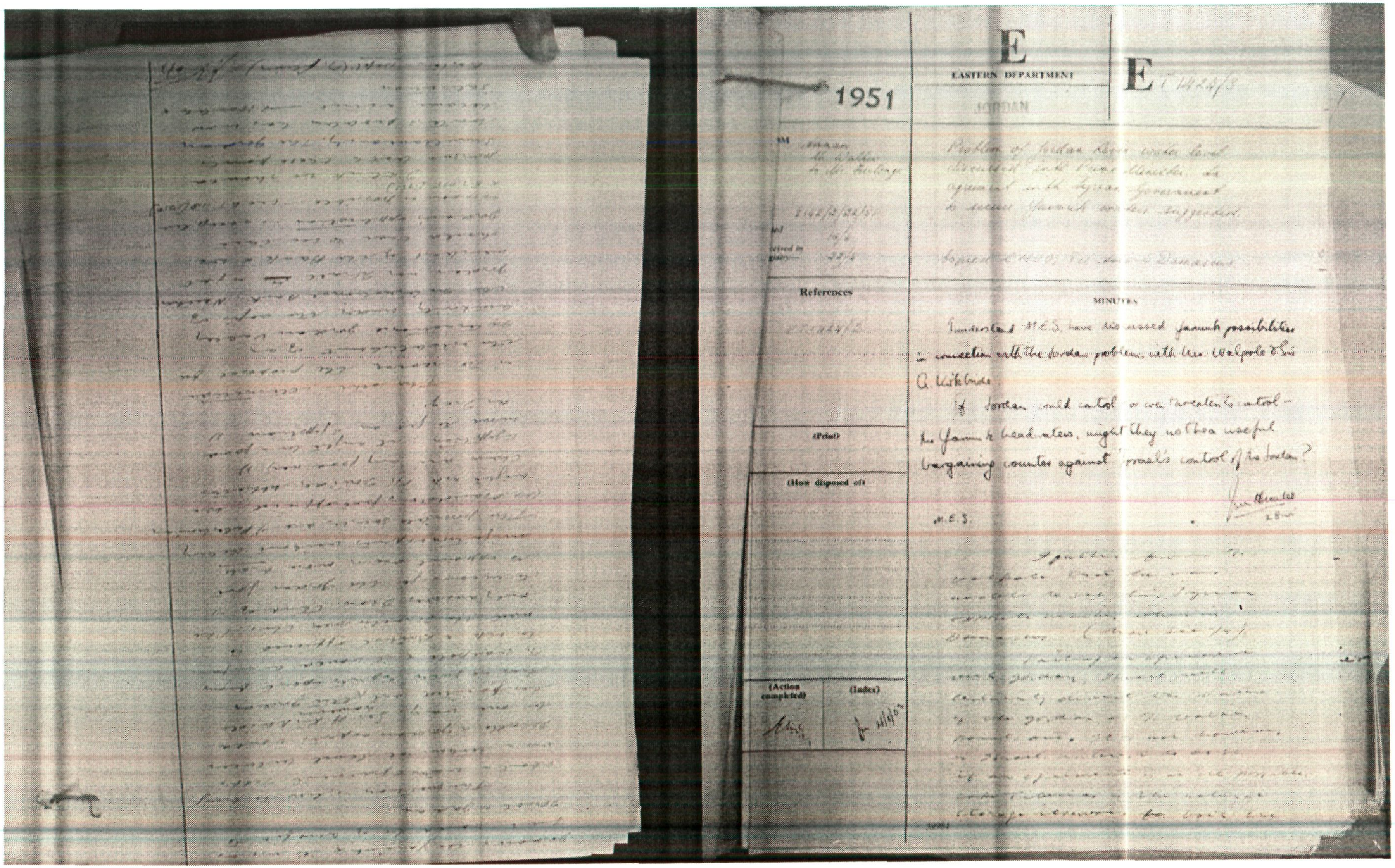
Eastern Department
Middle East Secretariat
United Nations Political Department

b.


1951

EASTERN DEPARTMENT

E

JORDAN

E 1424/3

Problem of Jordan River water level discussed with Prime Minister. An agreement with Syrian Government to secure Yarmuk waters suggested.

References

E 1424/2

MINUTES

Understand M.E.S. have discussed Yarmuk possibilities in connection with the Jordan problem with Mr. Walpole & Sir A. Kirkbride.

If Jordan could control or even threaten to control the Yarmuk headwaters, might they not be a useful bargaining counter against Israel's control of the Jordan?

M.E.S.

(Print)

(How disposed of)

(Action completed)

(Index)

[illegible]/2/88/63

Nothing to be Written in this Margin.

Minutes.

We have asked the French & Americans (& Sir Vincent Helm) whether they think there would be any advantage in making an informal approach to the Swedes. Perhaps we should consider this further on hearing from them.

[illegible signature] 12/7

Mr Hunt [illegible] 12-vii

1951	E EASTERN DEPARTMENT JORDAN	E T 1424/4

FROM Chancery, Damascus to E. Dept.

No. 1060/5/51

Dated 25th June 1951

Received in Registry 5th July 1951

Jordan River Water Level

If Mr. Walpole wishes to discuss question of use of the Yarmuk waters with Syrian authorities when he returns to Amman, he will be introduced to Syrians interested in this. Copied to Amman, Tel Aviv, BMEO.

References

ET 1424/1
/2
/3

MINUTES

[illegible]

(Print)

(How disposed of)

(Action completed) | (Index)

E 1424/3

Dear Geoffrey

[illegible]

I am copying this letter to [illegible] Middle East Office, Tel Aviv and Damascus.

Yours ever

[illegible signature]

G. W. Furlonge Esq., [illegible]
Eastern Department,
Foreign Office,
London, S.W.1.

BRITISH LEGATION,
TEL AVIV.

2nd July, 1951

(1421/5/51)
Confidential

Dear Geoffrey,

I have been very interested to see Amman despatch No. 93 of June 16th and Walker's letter No. S 142/2/22/51 of the same date to you about Jordan's interest in the Jordan waters.

2. It so happened that the former reached me some days before the letter. On reading it I did not, as a complete ignoramus in such matters, feel that the case was proved that Israel's present use of the water was directly responsible for the greater salinity. But I did feel that, if matters between Israel and Jordan were allowed to drift indefinitely and Israel went steadily on using more of the water without regard to the interests of her neighbours, Jordan might well wake up one day to find that little or no water at all was coming down. In fact, I felt that this matter of Jordan water lent strong support to the view expressed in the last paragraph of my despatch No. 245 of the 8th June that the Arab states would best serve their interests by co-operating in obtaining peace with Israel.

3. I have only seen Walker's letter today and am somewhat surprised to see him taking the view that, short of reconquering Israel, there is little that Jordan can do to prevent Israel diverting all the water of the Jordan. Apart from any arrangement that Jordan can make with Syria, I should myself have thought that Jordan would not today find it impossible to conclude an arrangement with Israel which would among other things guarantee her Jordan water.

4. I am sending copies of this letter to Rapp, Montagu-Pollock and Walker.

Yours ever,

Knox Helm

G.W. Furlonge Esq., C.M.G., O.B.E.,
Eastern Department,
Foreign Office,
London, S.W.1.

RESTRICTED.

10../5/51

T 1424/4

British Legation,
Damascus.

25th June, 1951.

Dear Department,

With reference to paragraph 2 of Mr. Walker's letter to Mr. Furlonge No. S.142/2/22/51 of the 16th June, Mr. Walpole did not, in fact, have an opportunity to discuss the use of the Yarmuk Waters with the Syrian authorities when he passed through Damascus recently on his way to the United Kingdom.

2. If he should wish to do so on his way back to Amman or if he prefers to visit Damascus after returning to Amman, we would be very willing to introduce him to the Ministers and Government officials interested in this question.

3. We are sending copies of this letter to Amman, Tel Aviv and the British Middle East Office.

Yours ever,
CHANCERY.

Eastern Department,
Foreign Office,
LONDON, S.W.1.

Registry No.

Top Secret / Secret / Confidential / Restricted / Open

Draft.
U.K. Delegation
New York

Telegram.

No. Saving

(Date)

Repeat to:—
Amman
Tel Aviv and Damascus; and Saving to Washington
Paris and
BMEO (Cairo)

~~En Clair. Code.~~ Cypher.

Distribution:—
Departmental
E. Dept.
U.N.(Pol.) Dept.

Copies to:—

NOTHING TO BE WRITTEN IN THIS MARGIN.

[ROUTINE]

F.O.

194

Despatched M.

Confidential

Addressed to U.K. Delegation New York No Saving [illegible] July. Repeated to Amman, Damascus and Tel Aviv; and Saving to Washington Paris and BMEO (Cairo)

Damascus telegram No. 215 [of 5th July: Diversion of Jordan] and my telegram No. 3351 Saving [of 9th July]

We suspect that the Syrian Government's anxiety to have Jordan's case considered together with their own is due to their desire to buttress the latter.

2. Jordan's case seems at first sight fairly sound.

3. We consider the two cases should be treated entirely separately and on their own merits.

4. Meanwhile United States Embassy inform us that United

1951

EASTERN DEPARTMENT

JORDAN

E [illegible]/6

FROM Mr. Lutyens [illegible]

REFERENCES

MINUTES

Jordan [illegible]

Jordan Government's [illegible] has not yet [illegible] the Security Council.

I submitted a draft on this subject today. I should be opposed to linking the Hulch complaint with the Jordan (submission) one.

[signature] 9/7

The Head of [illegible]

This was discussed with the Head of the U.S. Embassy, and the telegram has been amended in the light of information supplied by him.

[signature] 10/7

I produced a revised draft; but have now a reflexion [illegible] [illegible]. According to Mr Root the U.N. Secretariat discouraged the Jordan Minister from putting in his Government's protest and advised instead a reference to the P.C.C. [illegible]

(Print)

(How disposed of)

(Action completed) (Index)

Cypher/OTP

DEPARTMENTAL DISTRIBUTION

FROM DAMASCUS TO FOREIGN OFFICE

Mr. Montagu-Pollock
No. 215
5th July, 1951.

D. 3.30 p.m. 7th July, 1951.
R. 3.47 p.m. 6th July, 1951.

CONFIDENTIAL

Addressed to Foreign Office telegram No. 215 of 5th July.
Repeated for information to

Amman — Tel Aviv

Saving to New York (U.K.Del.) — B.M.E.O.(Cairo)
Washington — Bagdad
Paris

Amman despatch No. 93: Diversion Jordan.

The Syrian Prime Minister informed me today that Sir G. Webb had told the Syrian delegate to the United Nations that the Security Council had not received the Jordanian Government's protest, although he knew that it had been despatched from Amman. As Syria had no diplomatic relations with Jordan, he hoped that we could ascertain what had happened to it as he was anxious for Syria's and Jordan's case to be considered together by the Security Council.

Foreign Office please pass to Tel Aviv as my telegram No. 44 and U.K.Del. New York, Washington, Paris as my Saving telegrams Nos. 40, 49 and 58 respectively.

[Repeated to Tel Aviv and Saving to U.K.Del. New York, Washington and Paris]

DISTRIBUTED TO

Eastern Department
Middle East Secretariat
United Nations Political Department

FF

JUL 1951

NOTHING TO BE WRITTEN IN THIS MARGIN.

Registry No. ET 1424/6

Draft.

UKDEL New York

Telegram. (Saving)

No.

(Date)

Repeat to: Saving
Washington
Paris
BMEO Cairo
and Telegraphically to
Damascus
Amman
Tel Aviv.

En Clair. Code. Cypher. — by confidential bag, and Cypher

Distribution: Departmental (Eastern U.N.Pol.)

Copies to:—

Confidential.

F.O.

194

Despatched M.

Addressed UKDEL New York (Saving) telegram no. [illegible] of [illegible] repeated for information (Saving) to Washington, Paris, BMEO(Cairo) and (Telegraphically) to Damascus, Amman and Tel Aviv.

Damascus telegram no. 215 [of 5th July: Diversion of Jordan] ending telegram no. [illegible] (Saving) [of 9th July].

We suspect that Syrian object [illegible] in seeking to link the two complaints is to strengthen Syrian case.

on the other hand / at first sight [illegible] appear to have reasonable grounds for complaint [illegible] W [illegible] consider that the two cases [illegible] best dealt with separately.

We have understood from U.S. Embassy that 2 United Nations Secretariat have little enthusiasm [illegible] and suggest reference to [illegible] established [illegible] Armistice Agreement. [illegible] U.S. Embassy also say that [illegible] reference to the International Court.

Grateful for your comments.

No. 3142/2/29/51 E T 1424/7

HIS Majesty's Ch.d'Affaires at Amman presents his compliments to Middle East Sec.F.O. and has the honour to transmit to him the under-mentioned documents.

British Legation, Amman.

2nd July, 1951.

Reference to previous correspondence:

Description of Enclosure.

Name and Date.	Subject.
Copy of letter to Chancery, Tel Aviv, dated 2nd July, 1951.	Interference with the waters of the Jordan by Israel.

1951

EASTERN DEPARTMENT

E

JORDAN

E T 1424/7

Amman

No. 3142/2/29/51

Dated 2 July

Received in Registry— 7 July

References

E T 1424/2

MINUTES

Enquiries into operations actually being carried out which would alter the ... of the Jordan.

Copy of letter to Tel Aviv ... 7/7

(Print)

(How disposed of)

(Action completed)

(Index)

1951

EASTERN DEPARTMENT

JORDAN

E T 1424/8

REFERENCES

MINUTES

8142/3/29/51

CONFIDENTIAL

British Legation,
Amman.

2nd July, 1951.

Dear Chancery,

We refer to Mr. Walker's despatch No.93 dated 18th June on the subject of the Jordanian protest to the United Nations and the parties of the Tripartate declaration over Israeli interference with the waters of the Jordan.

2. It would be a great help to us here to know what operations are actually being carried out at Deganiya which could cause such a drop in level and increase in salinity of the Jordan. One possible explanation of the affair which you would be able to comment upon, is that the small run off from the north owing to the dry winter and the possible diversion operations in connection with the draining of the Hule have combined to cause this lessening of the flow of water and the consequent increase in salinity.

3. There is one further point of interest to us. Probably you have read the article in Engineering News Record by Waldo G. Bowman dated 22.3.51 on the new irrigation plans of Israel. Does this article in fact give an accurate picture of the actual intentions of the Israel Government? Has any work started on the plans outlined, and has the plan been phased for completion by certain dates?

4. We are sending a copy of this letter to Middle East Secretariat and the Chancery of the British Middle East Office.

Yours ever,
Amman Chancery.

Chancery,
H.M.Legation,
Tel Aviv.

1951

Le Walker,
AMMAN

No.
11 July
18 July

REFERENCES

EASTERN DEPARTMENT

JORDAN

E 1424/14

Jordan River Waters

The UN Secretariat advises that Jordan's complaint should be referred to the Palestine Conciliation Commission or the Truce Supervisory Council. [illegible]

MINUTES

Separate the minute of 14/7. (ET 1424/14)

14/7.

(Print)

(How disposed of)

En Clair

DEPARTMENTAL DISTRIBUTION

FROM NEW YORK TO FOREIGN OFFICE

(From United Kingdom Delegation to United Nations)

Sir G. Jebb

No. 717

11th July, 1951

D. 11.13 a.m. 11th July, 1951

R. 5.48 p.m. 11th July, 1951

Addressed to Foreign Office telegram No. 717 of 11th July

Repeated for information to Amman
Tel Aviv
Damascus
B.M.E.O. (Cairo)

and Saving to Washington
Bagdad
Paris

Amman despatch No. 93: Diversion of Jordan.

Jordan complaint now published as Security Council document S/2236. No request for Security Council action has yet been made.

Please pass to Amman, Tel Aviv, Damascus, B.M.E.O. (Cairo) as my telegrams Nos. 1, 15, 14, 3 and Bagdad and Paris as my Saving telegrams Nos. 20 and 128.

[Repeated to Amman, Tel Aviv, Damascus and B.M.E.O. (Cairo) and Saving to Bagdad and Paris].

DISTRIBUTED TO

Eastern Department
Middle East Secretariat
United Nations Political Department

0 0 0 0

NOTHING TO BE WRITTEN IN THIS MARGIN.

Registry No. ET 1424
CYPHER
OUT FILE

Draft.

U.K.DEL NEW YORK

Telegram.
No. 1033
(Date) 14/7
Repeat to:—
WASHINGTON 3039
AMMAN 279
TEL AVIV 324
DAMASCUS 346
BAGDAD 687
B.M.E.O.
SAVING to PARIS 2196

Cypher.

Distribution:—
Departmental
Eastern Department
B.M.E.O.
United Nations (Pol.) Department.

Copies to:—

14/7 1951.
Despatched M.

CONFIDENTIAL ....

Addressed to U.K.DEL NEW YORK ....
No. 1033 (date) 14/7 ....
Repeated for information to WASHINGTON,
AMMAN, TEL AVIV, DAMASCUS, BAGDAD, B.M.E.O.
AND SAVING TO PARIS ....

Amman telegram No. 214 [of 11th July] and Washington telegram No. 2187 [of 12th July: Jordan Waters].

ET 1424/19

We are inclined to doubt whether this question qualifies for discussion in the Security Council. In any event Jordan would be in a better position to appeal to the United Nations if she could show that she had made a serious attempt to negotiate with Israel direct (though we recognise that the prospects of such negotiation are not bright).

2. Nevertheless, we see much merit in the State Department's suggestion as reported in paragraphs 2 and 3 of Washington telegram under reference, and we should be grateful for your comments thereon.

3. Should you conclude that this is not a matter for the Security Council, we would advise Jordan either to refer it to General Riley or to submit it to the International Court direct. But before recommending the former course, we should wish to be satisfied

/that

Cypher/OTP DEPARTMENTAL DISTRIBUTION

FROM AMMAN TO FOREIGN OFFICE

Mr. Walker
No. 214
11th July, 1951
D. 5.50 p.m. 11th July, 1951
R. 7.30 p.m. 11th July, 1951

CONFIDENTIAL

Addressed to Foreign Office telegram No. 214 of 11th July.
Repeated for information to: UKDEL New York
Damascus
Tel Aviv
Washington
and Saving to: B.M.E.O. (Cairo)
Paris

E 1424/12

Damascus telegram No. 215 to you and your telegram No. 3351 to Washington: Jordan River Waters.

The Jordan Minister in Washington has reported to his Government that the United Nations Secretariat (through Bunche) advises referring Jordan's complaint about Jordan waters to the Palestine Conciliation Commission or the Truce Supervisory Council on the ground that the Security Council would refer it to one or the other anyhow. The French and Egyptian delegates to the United Nations advised reference to the Truce Supervisory Organization and Mr. McGhee recommended direct discussion with Israel but said that a final opinion would be given later.

2. The Jordan Prime Minister considers direct negotiation with Israel to be impossible and does not favour special Conciliation Commission which he regards as a broken reed. He proposes to insist that disputes first go to the Security Council since he prefers the Security Council should refer it to General Riley, rather than that it should be referred direct. Riley will in his view investigate the matter more seriously and more impartially if ordered to do so by the Security Council than he would on a direct complaint by Jordan. Moreover the Prime Minister feels that it is possible that the Security Council might refer the dispute to the International Court and this would be entirely satisfactory to Jordan.

3. The Jordan Prime Minister would be very grateful for your advice. Do you see any serious objection to the course he proposes?

Foreign Office please pass to UKDEL New York, Washington, Damascus and Tel Aviv as my telegrams 2, 2, 17 and 35 and to Paris as my Saving telegram No. 4.

[Repeated to UKDEL New York Washington Damascus and Tel Aviv and Saving to Paris].

DISTRIBUTED TO: Eastern Department
Middle East Secretariat
United Nations Political Department

JUL

???????

NOTHING TO BE WRITTEN IN THIS MARGIN

CYPHER

Registry No. E 1424/9

~~TOP SECRET~~
~~SECRET~~
~~CONFIDENTIAL~~
~~RESTRICTED~~
~~OPEN~~

~~EMERGENCY~~
~~IMMEDIATE~~
~~PRIORITY~~
ROUTINE

OVERNIGHT

Draft.

AMMAN

Telegram

No. 341

(Date) 19 7 51

Repeat to:

TEL AVIV 575
UKDEL (New York) 1040
DAMASCUS 357

and SAVING to:

WASHINGTON 155
BAGDAD
B.M.E.O. ~~(Cairo)~~
PARIS

M.E.S.
U.N.(Pol.) Dept. } first

Cypher

Distribution:
Departmental
E. Dept.
M.E.S.
U.N.(Pol.) Dept.

Copies to:

July 1951

Confidential

Addressed to: AMMAN. Tel No 341 of 19/7..

repeated for information to: TEL AVIV, UKDEL [New York], DAMASCUS, and SAVING to: WASHINGTON, BAGDAD, B.M.E.O. ~~(Cairo)~~, and PARIS.

Your telegram No.214 [of 11th July: Jordan Waters].

In view of paragraph 2 of UKDEL [New York] telegram No.738 we do not yet feel able to advise Jordan Prime Minister.

2. Please assure him that his request for advice ~~is~~ not ~~going by default~~. We are anxious to find the solution best calculated to assist him and are giving the question urgent consideration. ~~For the moment the only advice we can give is that he should take no further action until we are in a position to give him our conclusions.~~

Distributed to
Eastern Dept
Middle East Secretariat
United Nations Political Dept

OUT FILE

Cypher/OTP, and by
Confidential Bag.

FROM FOREIGN OFFICE TO NEW YORK.
(United Kingdom Delegation to United Nations).

No.1036.
14th July, 1951.

D. 5.20 p.m. 14th July, 1951.

PRIORITY.
CONFIDENTIAL.

Addressed to New York (UKDEL) telegram No.1036 of 14th July,
Repeated for information to Washington, Amman, Tel Aviv, Damascus, Bagdad, B.M.E.O. (Cairo).
and Saving to Paris No.2196.

Amman telegram No.211 [of 11th July] and Washington telegram No.2167 [of 12th July: Jordan Waters].

We are inclined to doubt whether this question qualifies for discussion in the Security Council. In any event Jordan would be in a better position to appeal to the United Nations if she could show that she had made a serious attempt to negotiate with Israel direct (though we recognise that the prospects of such negotiation are not bright).

2. Nevertheless, we see much merit in the State Department's suggestion as reported in paragraphs 2 and 3 of Washington telegram under reference, and we should be grateful for your comments thereon.

3. Should you conclude that this is not a matter for the Security Council, we would advise Jordan either to refer it to General Riley or to submit it to the International Court direct. But before recommending the former course, we should wish to be satisfied that Riley will not reject Jordan's application on the grounds that there has been no breach of the Armistice Agreement. Can we assume that the Secretariat's advise to Jordan Minister implied that Riley would in fact handle the case?

DISTRIBUTED TO:-
Eastern Department,
Middle East Secretariat,
United Nations Political Department.

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Cypher/OTP

DEPARTMENTAL DISTRIBUTION

FROM WASHINGTON TO FOREIGN OFFICE

Sir. O. Franks
No. 2167.
July 12th, 1951.

D. 10.48.p.m. July 12th, 1951.
R. 4.36.a.m. July 13th, 1951.

CONFIDENTIAL

E

Addressed to Foreign Office telegram No. 2167 of July 12th.
Repeated for information to New York (U.K.Del.), Amman, Tel Aviv, Damascus,
and Saving to B.M.E.O. (Cairo) and Paris.

Your telegram No. 3351 Saving: Jordan Waters.

State Department agree that tripartite declaration can not be appropriately invoked in this case.

2. They have for some time been concerned lest serious friction arises over the division of the Jordan Waters. They would see advantage in bringing the question into the purview of the United Nations and establishing some element of continuing and impartial supervision. This complaint by Kingdom of Jordan might, in their view, well provide an opportunity to do this.

3. In view of this we discussed paragraph 2 of Amman telegram No. 214 very briefly with them. They seemed to favour consideration of the complaint by the Security Council and its reference to Riley who might, in the circumstances, refer the question to an impartial panel of engineers.

4. In a private conversation with a member of my staff Gordan Clapp urged the setting up by the United Nations of an impartial group to establish facts of Jordan Water availability and his views may have influenced the department.

Foreign Office please pass to Amman, Tel Aviv, Damascus and Saving to B.M.E.O. (Cairo) and Paris as my telegrams Nos. 1, 12, 8, 193 and 268 respectively.

[Repeated to Amman, Tel Aviv, Damascus and Saving to B.M.E.O. (Cairo) and Paris].

DISTRIBUTED TO:-
Eastern Department
Middle East Secretariat
United Nations Political Department

WWWWW

14 JUL 1951

1951

E
EASTERN DEPARTMENT
JORDAN

E

Sir O. Franks,
Washington
2167
12 July
13 July

REFERENCES

Jordan waters.

They favour its consideration by the Security Council

MINUTES

(Print)

(How disposed of)

(Action completed)

(Index)

Cypher/OTP

DEPARTMENTAL DISTRIBUTION

FROM TEL AVIV TO FOREIGN OFFICE

Sir K. Helm
No. 256
12th July, 1951

D. 4.26 p.m. 12th July, 1951
R. 5.46 p.m. 12th July, 1951

CONFIDENTIAL

Addressed to Foreign Office telegram No. 256 of 12th July.

Repeated for information to: Amman
Damascus

and Saving to: Washington
Paris
B.M.E.O. (Cairo)
UKDEL New York

Your telegram No. 3351 Saving to Washington: Jordan Waters.

Israel Government are cognizant of Jordan protest, which has been reported in the press, and I understand they will be briefing their delegation to United Nations.

2. I fear representations to Israel, formal or otherwise, would have no useful effect. They might elicit the reply that Israel was ready to discuss the question with Jordan, but I note that Sir A. Kirkbride considers Jordan would turn down any such offer.

3. Please see my immediately following telegram.

Foreign Office please repeat to Amman and Damascus as my telegrams Nos. 38 and 66 and Saving to Washington, Paris, UKDEL New York and B.M.E.O. (Cairo) as my Saving telegrams Nos. 82, 57, 68 and 96 respectively.

[Repeated Amman and Damascus and Saving to Washington, Paris, UKDEL New York and B.M.E.O. (Cairo)].

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Eastern Department
Middle East Secretariat
United Nations Political Department

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14 JUL 1951

E
EASTERN DEPARTMENT
JORDAN

E

Sir K. Helm,
Tel Aviv
No. 256
Dated 12 July
Received in Registry 14 July

Jordan Water Dispute

Opinion that representations to Israel would have no useful effect

REFERENCES

MINUTES

(Print)

(How disposed of)

(Action completed)

(Index)

1951

E

EASTERN DEPARTMENT

JORDAN

E 1424/13

Sir G. Jebb
UK Del New York

CONFIDENTIAL

No. 788
Dated 16th July 1951
Received in Registry 17th July 1951

REFERENCES

E 1424/9.

Jordan Waters.

Reflects view that Jordan's complaint cannot be dealt with under the Israel–Jordan General Armistice Agreement. It would be best if complaint were dealt with by Security Council as part of Palestine question. Rpts to Amman, Tel Aviv, Damascus, Baghdad, Alexandria, BMEO (Cairo) & Paris.

MINUTES

Report the minute of 17/7

17/7

(Print)

(How disposed of)

Cypher/OTP

DEPARTMENTAL DISTRIBUTION

FROM TEL AVIV TO FOREIGN OFFICE

Sir K. Helm
No. 257
12th July, 1951

D. 1.43 p.m. 19th July, 1951
R. 6.04 p.m. 12th July, 1951

CONFIDENTIAL

Addressed to Foreign Office telegram No. 257 of 12th July.

Repeated for information to: Amman
Damascus

and Saving to: Washington
Paris
B.M.E.O. (Cairo)
UKDEL New York

E 1424/14

My immediately preceding telegram.

On 11th July the Military Attaché made snap tour of the southern end of Lake Tiberias and round to Ein Gev. Report will follow by bag.

2. Main points are:-

(a) Level of Lake is low but not excessively so.

(b) Flow through sluices appeared normal.

(c) There are no signs of any new works at or south of the southern end of the Lake.

3. General conclusion seems to be that reduced flow is due to exceptionally dry winter with unusual shortage of snow on Mount Hermon possibly accentuated by increased need of Israeli settlements on the west bank of the Jordan below Samakh.

Foreign Office please repeat to Amman and Damascus as my telegrams Nos. 39 and 67 and Saving to Washington, Paris, UKDEL New York and B.M.E.O. (Cairo) as my Saving telegrams Nos. 83, 58, 69 and 97 respectively.

[Repeated Amman and Damascus and Saving to Washington, Paris, UKDEL New York and B.M.E.O. (Cairo)].

DISTRIBUTED TO:

Eastern Department
Middle East Secretariat
United Nations Political Department

7777777

14 JUL 1951

Registry No. E 11424/13

~~PUT OUT FILE~~

Draft telegram

United Kingdom Delegation, New York.

No. 1084
Date 19.7.51

Repeat to:-
Amman 840.
Tel Aviv 274
Damascus 256
and Saving to
Alexandria (134)
Bagdad (?)
B.M.E.O.
Paris
Washington

Cypher

Distribution:-
Departmental

E. Dept.
M.E.S.
U.N.(Pol) Dept.

M.E.S.
U.N. (Pol) Dept.
first
C. Wardrop
17/7

CONFIDENTIAL.

Addressed to United Kingdom Delegation, New York telegram No. 1079 or 19th July.

Repeated for information to Amman, Tel Aviv and Damascus; and Saving to: Alexandria, Bagdad, B.M.E.O. ~~(Cairo)~~, Paris and Washington.

Your telegrams Nos. 738 and 739 [of the 16th July: Jordan waters and Syria/Israel].

We favour proposals outlined in paragraph 1 of your telegram No. 738 and paragraph 3 of your telegram No. 739.

2. We have for some time been considering the possibility of establishing some form of international Jordan Valley authority (compare the American proposal for an "element of continuing and impartial supervision" as reported in Washington telegram No. 2167), and of inducing the International Bank to finance it at least in part. In the circumstances there might be advantage in asking the Bank whether it would be prepared to lend its good offices by furnishing the personnel of the proposed technical commission of investigation.

3. Please discuss this idea with your United States colleague and report your conclusions. Meanwhile we are considering what alternative experts might serve.

4. We are not certain what is meant by proposal that Jordan complaint should be dealt with as part of Palestine question and should welcome elucidation to enable us to advise Jordan Government when the way is clear.

Cypher/OTP

DEPARTMENTAL DISTRIBUTION

FROM NEW YORK TO FOREIGN OFFICE

(United Kingdom Delegation to United Nations)

Sir G. Jebb
No. 738
16th July, 1951.

D. 11.54 p.m. 16th July, 1951.
R. 8.50 a.m. 17th July, 1951.

PRIORITY

CONFIDENTIAL

Addressed to Foreign Office telegram No. 738 of 16th July.
Repeated for information to Amman, Tel Aviv,
and Saving to Damascus, Bagdad,
Alexandria, B.M.E.O. (Cairo),
Paris, Washington.

Your telegram No. 1038: Jordan waters.

Riley told us today that he did not consider Jordan's complaint could be dealt with under the Israel-Jordan General Armistice Agreement. In my view it would be best for Jordan to ask for their complaint to be dealt with by the Security Council as a part of the Palestine question; it could then be discussed as a question closely related to the Lake Hule drainage project and we might work for a resolution establishing a technical commission to report on the whole question of the control and utilisation of Jordan waters. The Americans and French seem to agree with this. (See my immediately following telegram).

2. I think it would be advisable not to encourage Jordan to ask for their complaint to be put on the Council's agenda until we have discussed the proposal for a commission further.

Please repeat Priority to Amman and Tel Aviv as my telegrams 2 and 11 and to Damascus, Bagdad, Alexandria, B.M.E.O. (Cairo) and Paris as my Saving telegrams 2, 21, 36, 34 and 137 respectively.

[Repeated to Amman, Tel Aviv, and Saving to Damascus, Bagdad, Alexandria, B.M.E.O. (Cairo) and Paris.]

DISTRIBUTED TO:

Eastern Department.
Middle East Secretariat.
United Nations (Political) Department.

17 JUL 1951

XXX

1951	**E**
	EASTERN DEPARTMENT
	JORDAN
[FR]OM Foreign Office	**E** 14214/4
Minute	Jordan Waters
To Oliver.	Jordan complaint concerning Israeli
No.	diversion of Jordan River waters
Dated 13th July 1951	
Received in Registry— 15th July 1951	
References	**MINUTES**
ET 14214/1	
(Print)	
(How disposed of)	
(Action completed)	(Index)

OUT FILE

Cypher/OTP and
by Confidential Bag

DEPARTMENTAL DISTRIBUTION

FROM FOREIGN OFFICE TO NEW YORK
(To United Kingdom Delegation to United Nations)

No. 1089.
July 19th, 1951. D. 8.40.p.m. July 20th, 1951.

CONFIDENTIAL

Addressed to New York (U.K.Del.) telegram No. 1089 of July 19th.
Repeated for information to Amman, Tel Aviv, Damascus,
and Saving to Alexandria No. 189,
Bagdad No. 177,
B.M.E.O. (Cairo) No. 1030,
Paris No. 278,
and Washington No. 3536.

Your telegrams Nos. 738 and 739 [of the 18th July: Jordan waters and Syria/Israel].

We favour proposals outlined in paragraph 1 of your telegram No. 738 and paragraph 3 of your telegram No. 739.

2. We have for some time been considering the possibility of establishing some form of international Jordan Valley authority (compare the American proposal for an "element of continuing and impartial supervision" as reported in Washington telegram No. 2167) and of inducing the International Bank to finance it at least in part. In the circumstances there might be advantage in asking the Bank whether it would be prepared to lend its good offices by furnishing the personnel of the proposed technical commission of investigation.

3. Please discuss this idea with your United States colleague and report your conclusions. Meanwhile we are considering what alternative experts might serve.

4. We are not certain what is meant by proposal that Jordan complaint should be dealt with as part of Palestine question and should welcome elucidation to enable us to advise Jordan Government when the way is clear.

DISTRIBUTED TO:-
Eastern Department
Middle East Secretariat
United Nations Political Department

NOTHING TO BE WRITTEN IN THIS MARGIN

Jordan Complaint Concerning Israel Diversions of Jordan River Waters.

Flag A
Flag B

The complaint made by the Jordan Government to the Secretary General of the United Nations has now been published as a Security Council Document S 2236. So far, however, no request for action by the Council has been made.

Flag C

2. The United Nations Secretariat have apparently suggested that the complaint be referred (whether by Jordan or by the Secretariat is not clear) to the Palestine Conciliation Commission or the Truce Supervision Organisation, on the grounds that the Security Council would send it to one of these bodies anyhow.

3. The French (and the Egyptian) Delegates in New York suggest that the complaint should go to the Truce Supervision Organisation. The initial American reaction is to ~~welcome~~ recommend direct talks between Jordan and Israel.

4. The Jordan Prime Minister rules out what is obviously the best solution, namely direct talks with Israel, and does not favour reference to the "Special Conciliation Commission" (by which must I think be meant the P.C.C.). He would wish the complaint to go before the Security Council and be referred by the Council either to General Riley or to the International Court. He would, however, welcome our advice.

The dispute does not arise from the Armistice Agreement, and it therefore seems doubtful whether either General Riley or the Truce Supervision Organisation or for that matter the Special Committee established under Article VIII of the Armistice Agreement can be brought into it. We are also inclined to share the Jordan Prime Minister's views about the uselessness of a reference to the P.C.C. It would, moreover, seem from the juridical nature of the dispute that the International Court is the more appropriate forum if Israel will agree to accept its jurisdiction.

For Jordan to raise the matter in the Security Council has the disadvantage (both from our point of view and that of the Jordanians) that this dispute is liable to get tied up with the Suez Canal and Lake Huleh issues, although it has, in fact, ~~nothing~~ also to do with the Israel/Arab conflict. Furthermore, the technicalities involved are such that it is doubtful whether the Security Council will probably understand them. Also, the Security Council cannot direct a reference to the International Court but can only recommend to the parties that they should take the dispute thither, which Israel may refuse to do. On the other hand, the Council can ask the Court to an advisory opinion which, although not binding, might well prove useful.

It is submitted that our advice to the Jordan Prime Minister should be first to seek (despite his misgivings) to discuss the matter directly with the Israelis, or, if either party will not enter into such direct discussions, to seek Israels

/agreement

agreement to a reference to the International Court coupled with an undertaking to abide by its decision. Failing that, we see no objection to Jordan's raising the matter in the Security Council. In the latter event, however, it is considered that Jordan's best plan would be to endeavour to secure the adoption of a resolution either (a) recommending the parties to go to the International Court (the efficacy of which would depend on Israel's attitude) or (b) calling on the International Court to give an advisory opinion.

We have not yet received replies from Washington, Paris and Tel Aviv to the suggestion made by us in

Flag D

paragraph 2 of our Telegram No.3351 Saving regarding informal representations by ourselves, the French and the Americans in Tel Aviv.

Draft submitted.

(P.R.Oliver).

13th July,1951.

Mr [illegible]
U.N. (Pol) Dept.
~~[illegible]~~

Flag E
Flag F

Now see Washington telegram No. 4167 and Tel Aviv No. 256 of the 12th July which have come in since the above minute was written. From the former it will be seen that the State Department favour the idea of bringing the question into the purview of the United Nations and of establishing some element of continuing and impartial supervision. They also seem to favour consideration of the complaints by the Security Council and its reference to General Riley, who might in his turn refer it to an impartial panel of engineers.

2. With this we can, I think, generally agree. It certainly seems doubtful whether direct negotiations between Israel and the Jordan would get anywhere, even if the Jordanians were prepared to embark on them. The P.C.C., as the Jordan Prime Minister points out, is a broken reed.

3. There is, however, one point in the American suggestion on which we are doubtful, and that is the proposal that the Security Council should refer the matter to General Riley. The latter is concerned with the supervision of the Armistice Agreement and the prevention of breaches thereof, and we are by no means certain that he has any locus standi to handle the present complaint.

4. Subject to the views of U.N. Political Department and the Legal Adviser we should favour the following course of action:-

(i) That the Security Council should discuss the matter and pass a resolution taking note of the complaint and calling for a full technical report.

/(ii)

Furthermore, if [illegible] in the Council, Jordan's [illegible] greatly strengthened if she had tried to settle the matter through more direct channels first ([illegible]). [illegible]

[illegible] the Israelis [illegible]

We [illegible], however, [illegible] to the Security Council if they wish. [illegible] to [illegible] Security Policy. I [illegible] for a "body of technicians" [illegible] by the Security Council.

[illegible] 14/7

I still feel attracted by the American suggestion (Washington Telegram No 2167), and have said so in the attached telegram to U.K. Delegation while at the same time covering the point made by Mr Dancett.

Tel. sent. (See on ET1424/9).

[illegible] 14/7

E 1951 | EASTERN DEPARTMENT | JORDAN | E 1424/15

From Chancery, Amman, to E. Dept.

No. 3 1412/2/32/51
Dated 4th July 1951
Received in Registry— 16th July 1951

Jordan Waters

Requests confirmation that since Jordan is not a member of the United Nations she cannot compel Israel to go to the International Court, nor appeal to the Security Council to have a decision of the Court enforced.

References: See ET1424/153

(Print)

(How disposed of)
Ldr) Chancery Amman
Cwp) Tel Aviv
"

(Action completed) [illegible] 31/7
(Index) [illegible] 11/10

MINUTES

Perhaps you could comment on the constitutional position? In any event, Israel has made the reservation (in accepting the compulsory jurisdiction of the Court) that such acceptance shall not apply to disputes with countries with whom she is not in friendly relations.

[illegible] 2/7

U.N.(Pol) Dept.

Jordan could not compel Israel to accept the Court's jurisdiction over the Jordan waters, not so much because she is not a member of the U.N. (since it is at least possible for non-members of UN to be parties to cases before the Court) as because of Israel's reservation mentioned above.

If the case did come before the Court, Jordan could appeal to the Security Council even though not a member of UN, under Article 35(2) of the Charter.

[illegible] 4/7.

Mr Fitzmaurice [illegible]

Furthermore, if [illegible] the Council, Jordan's case [illegible] strengthened [illegible] had tried to [illegible] the [illegible] (cf. Art 35 of the Charter). It [illegible] somewhat unreasonable [illegible] Council [illegible] communication between the 2 parties merely because [illegible] of a [illegible] is not [illegible] taste.

If we are in fact not opposed to direct contact between the Jordanians and the Israelis [illegible] encouraging it.

We cannot however stop the Jordanians taking it to the Security Council if they wish. The [illegible] seems to be [illegible] to [illegible] general [illegible], I [illegible] of a [illegible] for a "body of [illegible]" [illegible] by the Security Council.

[illegible] 4/7

I still feel attracted by the American suggestion (Washington telegram No 2167), and have said so in the attached telegram to U.K. Delegation while at the same time covering the point made by Mr Dunnett.

Tel. sent (See on ET1424/9).

[illegible] 14/7

39936

S143/2/32/51

CONFIDENTIAL

British Legation,
Amman.

4th July, 1951.

E T1424/15

Dear Department,

With reference to the third paragraph of Mr. Walker's letter to Mr. Furlonge No. S142/2/22/51 of June 15th about the waters of the River Jordan, the view of the Jordan Government's Adviser on International Law is that since Jordan is not a member of the United Nations she could not compel Israel to go to the International Court, nor appeal to the Security Council to have a decision of the Court enforced. Can you confirm that this is so?

Yours ever,
Amman Chancery.

P.C.O. [signature]

Eastern Department,
Foreign Office,
London, S.W.1.

I agree, except that, having regard to Article 93 of the Charter and Article 35 of the Statute of the Court, Jordan would have to become a party to the Statute before she could in the ordinary way bring a case before the Court. Even then she could not take Israel there compulsorily unless she had herself signed the necessary special provision to that effect which is known as the "Optional Clause". Finally, there is the difficulty, as Mr. Dunnett says, that Israel might plead the exception which she made to her own acceptance of the Optional Clause.

If the case could actually be brought before the Court, I think Jordan would have a direct right of appeal to the Security Council under Article 94 of the Charter, the second paragraph of which says that if any party to a case fails to carry out a judgment of the Court "the other party may have recourse to the Security Council".

There is also the point that, quite apart from any question of a case before the Court, Article 35, paragraph 2, enables a State which is not a member of the United Nations to bring to the attention of the Security Council or of the General Assembly "any dispute to which it is a party if it accepts in advance for the purposes of the dispute the obligations of pacific settlement provided in the present Charter".

G.G. Fitzmaurice
(G.G. Fitzmaurice)
26th July, 1951.

Draft. [initials] 27/7.

[initials] 27/7

Registry No.

Top Secret
Secret
Confidential
Restricted
Open

Draft.

Chancery
Amman
from
Eastern Dept.

Copy to Chancery,
Tel Aviv.

27/7

Dear Chancery,

Will you please refer to your letter no. 5 148/2/32/51 of the 14th July about a reference by Jordan to the International Court.

The fact that Jordan is not a member of the United Nations would not of itself preclude her from bringing her case before the Court. Having regard to Article 93 of the U.N. Charter and Article 35 of the Statute of the Court she would, however, have to become a party to the Statute before she could in the ordinary way do so. Even then, she could not claim to take Israel there compulsorily unless she had herself signed the necessary special provision to that effect, known as the "Optional Clause". And finally it would have to be remembered that Israel, in accepting the compulsory jurisdiction of the Court, made the reservation that her acceptance did not apply "to any dispute between the State of Israel and another State which refuses to establish

/or

or maintain normal relations with it."

It thus seems fairly clear that for the case to go to the Court the consent of both parties would be necessary, and we have been working on this assumption all along. On the other hand, once the Court had considered the case & come to a decision, it would we think be open for Jordan to appeal to the Security Council in the event of Israel's failing to abide by that decision, by virtue of Article 94 of the Charter, the second paragraph of which says that "if any party to a case fails to carry out a judgment of the Court the other party may have recourse to the Security Council."

All this has become rather academic — at least for the moment — in view of the current suggestion ~~that the question~~ for a Security Council Resolution recommending the despatch of a technical commission of investigation

We are copying this to Tel Aviv.

Yours ever

Eastern Dept.

27/7

NOTHING TO BE WRITTEN IN THIS MARGIN

1951	**E** EASTERN DEPARTMENT JORDAN — **E** T 1424/10
FROM United Nations Council GENERAL	Jordan Waters. Letter dated 6th July from Jordan Envoy to the U.S.A. addressed to Secretary General on question of salinity of the Jordan waters.
No. S/2260 Dated 10th July 1951 Received in Registry— 16th July 1951	
References	MINUTES
(Print)	
(How disposed of)	
(Action completed) (Index)	

OUT FILE

(ET 1424/15)

CONFIDENTIAL

FOREIGN OFFICE, S.W.1.

30th July, 1951.

Dear Chancery,

Will you please refer to your letter No. S.142/2/32/51 of 4th July about a reference by Jordan to the International Court.

2. The fact that Jordan is not a member of the United Nations would not of itself preclude her from bringing her case before the Court. Having regard to Article 93 of the United Nations Charter and Article 35 of the Statute of the Court she would, however, have to become a party to the Statute before she could in the ordinary way do so. Even then, she could not claim to take Israel there compulsorily unless she had herself signed the necessary special provision to that effect, known as the "Optional Clause". And finally it would have to be remembered that Israel, in accepting the compulsory jurisdiction of the Court, made the reservation that her acceptance did not apply "to any dispute between the State of Israel and another State which refuses to establish or maintain normal relations with it".

3. It thus seems fairly clear that for the case to go to the Court the consent of both parties would be necessary, and we have been working on this assumption all along. On the other hand, once the Court had considered the case and come to a decision, it would we think be open for Jordan to appeal to the Security Council in the event of Israel's failing to abide by that decision, by virtue of Article 94 of the Charter, the second paragraph of which says that if any party to a case fails to carry out a judgment of the Court "the other party may have recourse to the Security Council".

4. All this has become rather academic - at least for the moment - in view of the current suggestion for a Security Council Resolution recommending the despatch of a technical commission of investigation.

5. We are copying this to Tel Aviv.

Yours ever,

EASTERN DEPARTMENT.

UNITED NATIONS

SECURITY COUNCIL

ET 142-4/16

GENERAL

S/2236
10 July 1951

ORIGINAL: ENGLISH

LETTER DATED 6 JULY 1951 FROM THE ENVOY EXTRAORDINARY AND MINISTER PLENIPOTENTIARY OF THE HASHIMITE KINGDOM OF THE JORDAN TO THE UNITED STATES ADDRESSED TO THE SECRETARY-GENERAL

I have the honour to refer to our meeting on Tuesday, 19 June 1951, and to request the release to the honourable delegates at the United Nations of the cablegram sent to Your Excellency on 7 June 1951, by the Jordanian Minister for Foreign Affairs, concerning the complaint of the Hashimite Kingdom of the Jordan against Israel for the interference of the latter with the natural flow of the waters of the River Jordan, together with the report of the Jordanian Director of Lands and Surveys which I presented, at the meeting referred to above, with a map illustrating the report on the salinity of the River Jordan.

With respect to the presentation of the case to the Security Council, I shall notify Your Excellency of the reply of the Jordanian Government immediately upon its receipt.

(Signed) Dr. Y. HAIKAL
Envoy Extraordinary and
Minister Plenipotentiary

ANNEX I

CABLEGRAM DATED 7 JUNE 1951 FROM THE JORDANIAN MINISTER FOR FOREIGN AFFAIRS TO THE SECRETARY-GENERAL, CONCERNING THE WATERS OF THE RIVER JORDAN

I have honour request Your Excellency place on record following complaint and protest concerning infringement by Israeli Authorities against riparian rights of Hashemite Kingdom Jordan and take immediate steps ordering stoppage this aggression. Investigations carried out by Jordan Government experts established fact that Government Israel held up natural flow of River Jordan at southern outlet Lake Tiberias, namely at Deganiya Jewish settlement lying Israeli territory.

Quantity water thus held up estimated at 528,500,000 cubic metres per annum, a quantity which hitherto been used irrigation purposes in Jordan valley south Lake Tiberias in Jordan territory. Loss this water has caused considerable increase in salinity of waters River Jordan together with lowering its water level.

Seven pumps situated immediately north of Palestine Electric Corporation reservoir forming part of Idel Power Station and which now also operated by Israelis support Jordan Government contention. Amount of water removed by operation estimated 31,500,000 cubic metres per annum.

Abnormal rise in salinity has become catastrophic to cultivators who take irrigation water by pumps on both sides River Jordan in Jordan territory. Salinity its waters during British Mandatory period never exceeded 300 parts per million - permissible maximum for irrigation under Jordan valley soil conditions - whereas tests carried by Jordan Government experts during past three months showed this salinity have risen 1,130 parts per million at Allenby Bridge on Amman Jerusalem Highway.

Same disastrous salinity moreover decisively precluding all schemes of Palestine Arab refugees settlement in Jordan valley.

Unless prompt action taken to prevent this illegal interference by Israel in free flow of River Jordan at Deganiya, the general economy of Jordan Kingdom bound be seriously affected and all further development in irrigation from river must cease.

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ANNEX I

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/I shall be

I shall be grateful therefore if you kindly inform me at earliest possible of measures which you will take to stop and prevent continuance this grave interference in normal flow of waters River Jordan caused by violations and flagrant contravention of international law.

Anastas HANANIA
Minister for Foreign Affairs

ANNEX II

REPORT OF THE JORDANIAN DIRECTOR OF LANDS AND SURVEYS TO THE JORDANIAN MINISTER OF FINANCE AND ECONOMY

I have the honour to report that I proceeded to the Palestine Electric Corporation Power Station at Jisr el Majami on 12 May in order to investigate the causes for the serious drop in the discharge of the River Jordan which was thought to be responsible for the high salinity of the water of the river now prevailing between Jisr Sheikh Husein and the Dead Sea.

The investigation on the spot brought to light the following facts relating to the reservoir forming part of the Power Station.

1. The Arab Legion guard, who has been stationed at the P.E.C. works for two and a half years stated that as a rule the level of the reservoir remained constant within narrow limits, falling slightly during the day and rising again at night. This agrees with my own observations on my occasional visits to the place.

2. The Irrigation Officials present stated the variation in the level was probably due to the operation of Jewish pumps, stated to be seven in number, which are located on the north bank of the River Yarmuk for the purpose of raising water on to the lands of the Jewish settlement of Ashdot Yacov.

3. Three of the sluices attached to the penstocks leading to the turbine of the P.E.C. were leaking badly.

4. As the reservoir is being continually replenished by the full flow of the Yarmuk and as the level remains constant it is clear that the reservoir, at the level obtaining at the time of inspection, does not affect the volume of water flowing from the Yarmuk into the Jordan since at this level a state of equilibrium had been reached where the volume of water leaking through the sluices and the escape channel equals the discharge of the Yarmuk.

5. A comparison of the discharge measurements taken in the Yarmuk above Adasiya and in the Jordan at Jisr Sheikh Husein sixteen kilometres down stream from the confluence of the two rivers is shown in the table subjoined.

/Date

Date	Yarmuk (M3 per sec.)	Date	Jordan Jisr Sheikh Husein (M3 per sec.)
9/4/51	9.0	6/4/51	6.2
17/4/51	6.8	12/4/51	6.9
2/5/51	8.0	19/4/51	9.3
		26/4/51	11.6
		3/5/51	6.5

It will be seen from the above discharge measurements that except for the 19th and 26th of April the discharge of the Jordan at this point was approximately equivalent to the discharge of the Yarmuk after making allowances for the water absorbed by the Adasiya canal and the Jewish pumps.

The only conclusion that can be drawn from these figures is that for periods which may be long or short the gates at Deganiya interfere with the normal flow of the Jordan at its outlet from Lake Tiberias.

It is also significant that a study of the discharge records at Deganiya for the months of April and May in 1936 after a season of poor rainfall (47 per cent below normal in the Huleh area) shows that the average discharge during April was 7.5 M^3 per second and for May 5.9 M^3 per second. In view of the climatic analogue for the rainy seasons of 1935-1936 and 1950-1951 it may be assumed that, provided there was a free flow through the Deganiya sluice gates, the discharge of the Jordan during the months of April and May 1951 should be of the same order, and the combined flow of the Jordan and the Yarmuk at Jisr Sheikh Husein should average at least 14.5 M^3 per second in April and 13 M^3 per second in May.

In its course between Lake Tiberias and the Dead Sea the Jordan receives increments from saline drainage and springs particularly in the middle reaches which, however, are diluted normally by the fresh water from Lake Tiberias and the Yarmuk to the extent that the resulting salinity during the Mandatory period never exceeded 300 parts per million (the permissible maximum for irrigation under Jordan Valley soil conditions) even during periods of low discharge.

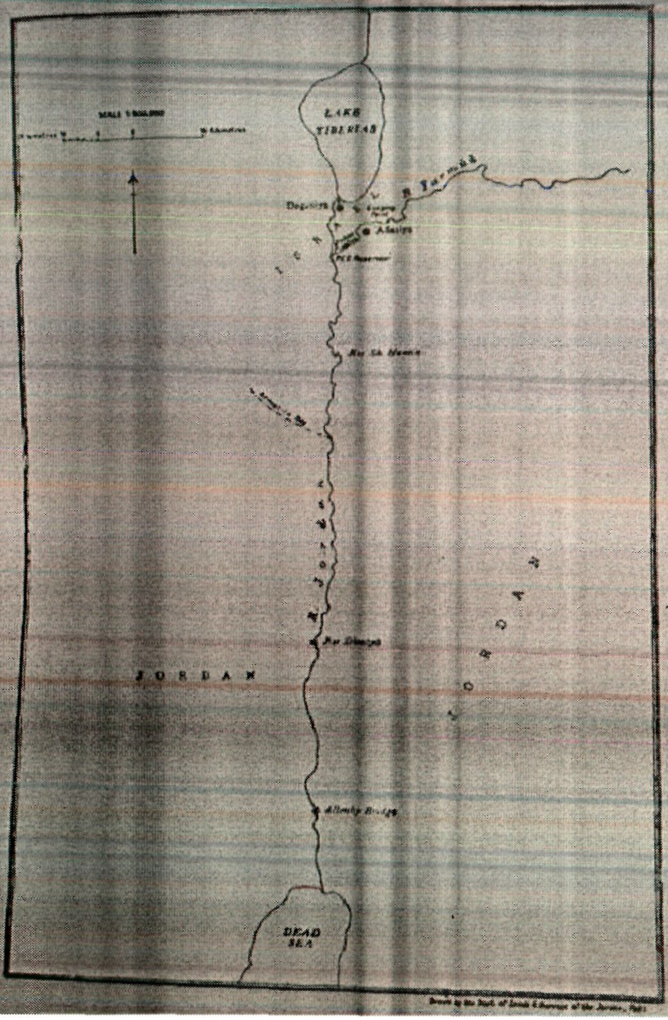
Salinity tests of the Jordan water are now being made regularly at Jisr Sheikh Husein, Jisr Damiyh and the Allenby Bridge, the results of which are tabulated as follows:

Date	JISR SHEIKH HUSEIN	Date	JISR DAMIYA	Date	ALLENBY BRIDGE
Sodium Chloride (NaCl): Parts per Million					
21/4/51	365	14/4/51	468	23/3/51	958
26/4/51	320	21/4/51	555	30/3/51	1132
28/4/51	307	1/5/51	436	6/4/51	969
1/5/51	355			13/4/51	999
8/5/51	349			20/4/51	944
				28/4/51	982

/It is clear

ANNEX III

Map illustrating Report on Salinity of the Jordan
From Jisr Sh. Hussein to the Dead Sea



S/2236
Page 6

It is clear therefore that the reduction in the normal flow of the Jordan by closing the sluice gates controlled by the Jews at Deganiya has increased the salinity of the river to such an extent as to make irrigation no longer feasible between Jisr Sheikh Husein and the Dead Sea.

The consequences arising from this abnormal increase in the salinity of the Jordan can only be described as disastrous to the existing cultivators taking irrigation water by pumps on both sides of the river, but also it effectively and decisively precludes all schemes of refugee settlement in the Jordan Valley. I am informed by the United Nations Relief and Works Agency for Palestine Refugees in the Near East that it has under active consideration four schemes in this area, each one dependent on pumping water from the river. Private enterprise is also engaged in developing land in the Valley with the intention of pumping water from the same source.

Therefore, unless immediate action is taken by Government to prevent the existing unwarranted interference in the free flow of the river at Deganiya, the economy of Jordan will be seriously affected and all further development depending on irrigation from the River Jordan must cease.

For easy reference I attach a map on which is shown all places mentioned in this report.

(Signed) G.F. WALPOLE
Director of Lands and Surveys

/ANNEX III

Cypher/OTP

.1424/17

DEPARTMENTAL DISTRIBUTION

FROM TEL AVIV TO FOREIGN OFFICE

Mr. Chadwick
No. 266
19th July, 1951.

D. 10.35 a.m. 19th July, 1951.
R. 12.7 p.m. 19th July, 1951.

CONFIDENTIAL

Addressed to Foreign Office telegram No. 266 of 19th July
Repeated for information to Amman
Damascus
and Saving to Washington
Paris
B. M. E. O. (Cairo)
U.K. Delegation New York

Sir Knox Helm's telegram No. 256; Jordan water. ET 1424/11

According to the Director General of Israeli Ministry of Foreign Affairs it is now established, subject to final check that the fall in water level is wholly due to (a) failure of rains, and (b) omission to close the Degania sluices during the winter to hold up the waters of Lake Tiberias because waters never reached the level at which this is normally done. Until next winter rains the remedy "is beyond human agency."

Foreign Office please repeat to Amman and Damascus as my telegrams Nos. 40 and 68 and saving to Washington, Paris, United Kingdom Delegation New York and B. M. E. O. (Cairo) as my telegrams Nos. 84, 59, 70 and 100 respectively.

[Repeated to Amman and Damascus and saving to Washington, Paris, United Kingdom Delegation New York and B. M. E. O. (Cairo)]

DISTRIBUTED TO
Eastern Department
Middle East Secretariat
United Nations Political Department

B B B

21 JUL 1951

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EASTERN DEPARTMENT

ET 1424/17

JORDAN

1951

Mr. Chadwick
Tel Aviv.

CONFIDENTIAL

No. 266
Dated 19th July 1951
Received in Registry 21st July 1951

Jordan Waters.

Israel view that fall in water-level is due to failure of rains and omission to close the Degania sluices during the winter.

Rptd Amman, Damascus, W'ton, Paris, BMEO (Cairo) and UKDel. N. York

REFERENCES

ET 1424/11

MINUTES

Refer to the minute.

23/7

(Print)

(How disposed of)

(Action completed) (Index)

[illegible] 23/7 [illegible] 11/1/57

CONFIDENTIAL
(1421/18/51)

ET1424/18

British Legation,
TEL AVIV.

16th July, 1951.

Dear Wardrop,

I have just seen Foreign Office telegram No. 1038 to the United Kingdom Delegation at New York about the Jordan Waters and I think I ought to send you a word of warning about the mention in paragraph 3 of a possible reference to the International Court. As you will see from our P.L. No. 336 of the 5th December, 1950, and subsequent correspondence, Israel's declaration accepting the compulsory jurisdiction of the Court contained a reservation saying that the declaration did not apply "to any dispute between the State of Israel and another State which refuses to establish or maintain normal relations with it" - meaning the Arab states. I am not sure how far this affects the practicability of bringing the question before the International Court but it may be desirable to go into the question rather carefully before suggesting the International Court as a means of dealing with the dispute.

2./

VR256/12

J.C.Wardrop, Esq.,
Eastern Department,
FOREIGN OFFICE, S.W.1.

1951

E
EASTERN DEPARTMENT

JORDAN

ET 1424/18

From Mr Chadwick, Tel Aviv
to Mr Wardrop

No. 1421/18/51
Dated 16th July 1951
Received in Registry— 18th July 1951

Jordan Waters

View that question should be gone into carefully before suggesting it be taken to the International Court.

Copies: New York (UKDel) and Washington.

References

MINUTES

UN(R2)/48...

(Print)

(How disposed of)

(Action completed)	(Index)
31/7	4/8

39984

4/19

CONFIDENTIAL
(1421/18/51)

ET 1424/18

British Legation,
TEL AVIV.

16th July, 1951.

Dear Wardrop,

I have just seen Foreign Office telegram No. 1038 to the United Kingdom Delegation at New York about the Jordan Waters and I think I ought to send you a word of warning about the mention in paragraph 3 of a possible reference to the International Court. As you will see from our P.L. No. 336 of the 5th December, 1950, and subsequent correspondence, Israel's declaration accepting the compulsory jurisdiction of the Court contained a reservation saying that the declaration did not apply "to any dispute between the State of Israel and another State which refuses to establish or maintain normal relations with it" - meaning the Arab states. I am not sure how far this affects the practicability of bringing the question before the International Court but it may be desirable to go into the question rather carefully before suggesting the International Court as a means of dealing with the dispute.

2./

J.C. Wardrop, Esq.,
Eastern Department,
FOREIGN OFFICE, S.W.1.

E 1951 ET 1424/18
EASTERN DEPARTMENT
JORDAN
From Mr Chadwick, Tel Aviv.
CONFIDENTIAL
Jordan Waters.
REFERENCES
ET 1424/17
MINUTES

1951

EASTERN DEPARTMENT

JORDAN

E E1424/20

From Mr. Hayter, Paris.

CONFIDENTIAL

No. 437 Saving

Dated 25th July 1951

Received in Registry 25 July 1951

Jordan Waters.

French views on Jordan request for action under Tripartite Declaration.

Rptd: UKDel, New York, W'ton, Amman, Tel Aviv, Damascus and BMEO.

REFERENCES

E1424/2.

MINUTES

We should await the reply from Tel. no. 1084(?) from New York (who will consider this, no doubt), before advising the Jordan Govt on this last line.

[illegible] 27/7

This is in a letter of 27/7 today to Amman. You have referred [illegible] 27/7

(Action completed) [illegible] 27/7

(Index) [illegible] 1/8/51

En Clair and By Confidential Bag

E1424/[illegible]

From Tel Aviv to Foreign Office

Mr. J. E. Chadwick
No. 31 Saving
24th July, 1951

Repeated Saving to:
Amman No. 63
Damascus No. 24
Washington No. 87
Paris No. 62
New York (UKDEL) No. 73
B.M.E.O. No. 103

CONFIDENTIAL

Addressed to Foreign Office telegram No. 31 Saving of 24th July. Repeated for information to Amman, Damascus, Washington, Paris, New York, (UKDEL) and B.M.E.O.

My telegram No. 265: Jordan Water.

To alleviate the shortage in Jordan the sluices are now being closed and opened at intervals of a few days in order to give periodically increased flow.

2. Attitude of Israel authorities to Jordan complaint is that there is absolutely no case for the Security Council: security is not involved. Nor have the Jordanians any complaint on legal grounds, being protected neither by international law nor by any specific convention. At no time have the Jordanians attempted to discuss the problem, though Israelis are perfectly ready to do so.

3. In any discussion of the problem between Jordan and Israel, Israel would wish to add to the agenda fresh water supply for the potash works at south end of Dead Sea.

CHADWICK

APPENDIX-A

HELSINKI RULES ON THE USES OF THE WATERS OF INTERNATIONAL RIVERS

Adopted by the International Law Association at its Fifty-second Conference held at Helsinki in 1966

GENERAL

Article I

The general rules of international law as set forth in these chapters are applicable to the use of the waters of an international drainage basin except as may be provided otherwise by convention, agreement or bindingcustom among the basin States.

Article II

An international drainage basin is a geographical area extending over two or more States determined by the watershed limits of the system of waters, including surface and underground waters, flowing into a common terminus.

Article III

A"basin State" is a state the territory of which includes a portion of an international drainage basin.

EQUITABLE UTILIZATION OF THE WATERS OF AN INTERNATIONAL DRAINAGE BASIN

Article IV

Each Basin State is entitled to a reasonable and equitable share in the beneficial uses of the waters of an international drainage basin.

Article V

(1) What is a reasonable and equitable share within the meaning of Article I is to be determined in the light of all the relevant factors in each particular case.

(2) Relevant factors which are to be considered include, but are not limited to:

(a) The geography of the basin including in particular the extent of the drainage area in the territory of each basin State;

(b) The hydrology of the basin, including in particular the contribution of water by each basin State;

(c) The climate affecting the basin;

(d) The past utilization of the waters of the basin, including in particular existing utilization;

(e) The economic and social needs of each basin State;

(f) The population dependent on the waters of the basin in each basin State;

(g) The comparative costs of alternative means of satisfying the economic and social needs of each basin State;

(h) The availability of other resources;

(i) The avoidance of unnecessary waste in the utilization of waters of the basin;

(j) The practicability of compensation to one of more of the co-basin States as a means of adjusting conflicts among uses; and

(k) The degree to which the needs of a basin State may be satisfied, without causing substantial injury to a co-basin State.

(3) The weight to be given to each factor is to be determined by its importance in comparison with that of other relevant factors. In determining what is a reasonable and equitable share, all relevant factors are to be considered together and a conclusion reached on the basis of the whole.

Article VI

A use or category of uses is not entitled to any inherent preference over any other use or category of uses.

Article VII

A basin State may not be denied the present reasonable use of the waters of an international drainage basin to reserve for a co-basin State a future use of such waters.

Article VIII

1. An existing reasonable use may continue in operation unless the factors justifying its continuance are outweighed by other factors leading to the con clusion that it be modified or terminated so as to accommodate a competing incompatible use.

2. (a) A use that is in fact operational is deemed to have been an existing use from the time of the initiation of construction directly related to the use or, where such construction is not required, the undertaking of comparable acts of actual implementation.

(b) Such a use continues to be an existing use until such time as it is discontinued with the intention that it be abandoned.

3. A use will not be deemed an existing use if at the time of becoming operational it is incompatible with an already existing reasonable use.

NAVIGATION

Article XII

1. This Chapter refers to those rivers and lakes portions of which are both navigable and separate or traverse the territories of two or more States.

2. Rivers or lakes are "navigable" if in their natural or canalized state they are currently used for commercial navigation or are capable by reason of their natural condition of being so used.

3. In this Chapter the term "riparian State" refers to a State through or along which the navigable portion of a river flows or a lake lies.

Article XIII

Subject to any limitations or qualifications referred to in these Chapters, each riparian State is entitled to enjoy rights of free navigation on the entire course of a river or lake.

Article IX

"Free navigation", as the term is used in this Chapter, includes the following freedom for vessels of a riparian State on a basis of equality:

(a) Freedom of movement on the entire navigable course of the river or lake;

(b) Freedom to enter ports and to make use of plants and docks; and

226 APPENDICES

(c) Freedom to transport goods and passengers, either directly or through trans-shipment, between the territory of one riparian State and the territory of another riparian State and between the territory of a riparian State and the open sea.

*Article XV*A

riparian State may exercise rights of police, including but not limited to the protection of public safety and health, over that portion of a river or lake subject to its jurisdiction, provided the exercise of such rights does not unreasonably interfere with the enjoyment of the rights of free navigation defined in Articles XIIIand XIV*Article XVI* Each riparian State may restrict or prohibit the loading by vessels of a foreign State of goods and passengers in its territory for discharge in such territory.

Article XVII

A riparian state may grant rights of navigation to non-riparian States on rivers or lakes within its territory.

Article XVIII

Each riparian State is, to the extent of the means available or made available to it, required to maintain in good order that portion of the navigable course of a river or lake within its jurisdiction.

Article XIX

The rules stated in this Chapter are not applicable to the navigation of vessels of war or of vessels performing police or administrative functions, or, in general, exercising any other form of public authority.

Article XX

In time of war, other armed conflict, or public emergency constituting a threat to the life of the State, a riparian State may take measures derogating from its obligations under this Chapter to the extent strictly required by the exigencies of the situation, provided that such measures are not inconsistent with its other obligations under international law. The riparian States shall in any case facilitate navigation for humanitarian purposes.

Article XXI

The floating of timber on a watercourse which flows through or between the territories of two or more States is governed by the following Articles except in cases in which floating is governed by rules of navigation according to applicable law or custom binding upon the riparians.

Article XXII

The States riparian to an international watercourse utilized for navigation may determine by common consent whether and under what conditions timber floating may be permitted upon the watercourse.

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Article XIII

1. It is recommended that each State riparian to an international watercourse not used for navigation should, with due regard to other uses of the watercourse, authorize the co-riparian States to use the watercourse and its banks within the territory of each riparian State for the floating of timber.

2. This authorization should extend to all necessary work along the banks by the floating crew and to the installation of such facilities as may be required for the timber floating.

Article XXIV

If a riparian State requires permanent installations for floating inside a territory of a co-riparian State or if it is necessary to regulate the flow of the watercourse, all questions connected with these installations and measures should be determined by agreement between the States concerned.

Article XXV

Co-riparian states of a watercourse which is or is to be used for floating timber should negotiate in order to come to an agreement governing the administrative regime of floating, and if necessary to establish a joint agency or commission in order to facilitate the regulation of floating in all aspects.

PROCEDURES FOR THE PREVENTION AND SETTLEMENT OF DISPUTES

Article XXVI

This chapter relates to procedures for the prevention and settlement of international disputes as to the legal rights or other interests of basin States and of other States in the waters of an international drainage basin.

Article XXVI

1. Consistently with the Charter of the United Nations, States are under an obligation to settleinternational disputes as to their legal rights or other interests by peaceful means in such a manner that international peace and security, and justice are not endangered.

2. It is recommended that States resort progressively to the means of prevention and settlement of disputes stipulated in *Articles XXIX to XXXIV.*

Article XXVIII

1. States are under a primary obligation to resort to means of prevention and settlement of disputes stipulated in the applicable treaties binding upon them.

2. States are limited to the means of prevention and settlement of disputes stipulated in treaties binding upon them only to the extent provided by the applicable treaties.

Article XXIX

1. With a view to preventing disputes from arising between basin States as to their legal rights or otherinterests, it is recommended that each basin State furnish relevant and reasonably available information to the other basin States concerning the waters of a drainage basin within its territory and its use of, and activities with respect to, such waters.

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2. A State, regardless of its location in a drainage basin, should in particular furnish to any other basin State, the interests of which may be substantially affected, notice of any proposed construction or installation which would alter the regime of the basin in a way which might give rise to a dispute as definedin Article XXVI. The notice should include such essential facts as will permit the recipientto make an assessment of the probable effect of the proposed alteration.

3. A State providing the notice referred to in paragraph 2 of this Article should afford to the recipient a reasonable period of time to make an assessment of the probable effect of the proposed construction or installation and to submit its views thereon to the State furnishing the notice.

4. If a State has failed to give the notice referred to in paragraph 2 of this Article, the alteration by the State in the regime of the drainage basin shall not be given the weight normally accorded to temporal priority to use in the event of a determination of what is a reasonable and equitable share of the waters of the basin.

Article XXX

In case of a dispute between States as to their legal rights or other interests, as defined in Article XXVI, they should seek a solution by negotiation.

Article XXXI

1. If a question or dispute arises which relates to the present or future utilization of the waters of an international drainage basin, it is recommended that the basin States refer the question or dispute to a joint agency and that they request the agency to survey the international drainage basin and to formulate plans or recommendations for the fullest and most efficient use thereof in the interests of all such states.

2. It is recommended that the joint agency be instructed to submit reports on all matters within its competence to the appropriate authorities of the member States concerned.

3. It is recommended that the member States of the joint agency in appropriate cases invite non-basin States which by treaty enjoy a right in the use of the waters of an international drainage basin to associate themselves with the work of the joint agency or that they be permitted to appear before the agency.

Article XXXII

If a question or a dispute is one which is considered by the States concerned to be incapable of resolution in the manner set forth in Article VI, it is recommended that they seek the good offices, or jointly request the mediation of a third State, of a qualified international organization or of a qualified person.

Article XXXIII

1. If the States concerned have not been able to resolve their dispute through negotiation or have been unable to agree on the measures described in Articles XXXI and XXXII, it is recommended that they form a commission of inquiry or an ad hoc conciliation commission, which shall endeavour to find a solution, likely to be accepted by the States concerned, of any dispute as to their legal rights.

2. It is recommended that the conciliation commission be constituted in the manner set forth in the Annex.

Article XXXIV

It is recommended that the States concerned agree to submit their legal disputes to an ad hoc arbitral tribunal, to a permanent arbitral tribunal or to the International Court of Justice if

(a) A commission has not been formed as provided in Article XXXIII, or

(b) The commission has not been able to find a solution to be recommended, or

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(c) A solution recommended has not been accepted by the States concerned, and

(d) An agreement has not been otherwise arrived at.

Article XXXV

It is recommended that in the event of arbitration the States concerned have recourse to the Model Rules on Arbitral Procedure prepared by the International Law Commission of the United Nations at its tenthsession in 1958.

Article XXXVI

Recourse to arbitration implies the undertaking by the States concerned to consider the award to be given as final and to submit in good faith to its execution.

Article XXXVII

The means of settlement referred to in the preceding Articles of this Chapter are without prejudice to the utilization of means of settlement recommended to, or required of, members of regional arrangements or agencies and of other international organizations.

APPENDIX-B
ISRAEL-JORDAN PEACE TREATY

Water and Related Matters

Pursuant to Article 6 of the Treaty, Israel and Jordan agreed on the following Articles on water related matters:

Article I: Allocation

1. Water from the Yarmouk River
    a. Summer period - 15th May to 15th October of each year. Israel pumps (12) MCM and Jordan gets the rest of the flow.
    b. Winter period - 16th October to 14th May of each year. Israel pumps (13) MCM and Jordan is entitled to the rest of the flow subject to provisions outlined hereinbelow: Jordan concedes to Israel pumping an additional (20) MCM from the Yarmouk in winter in return for Israel conceding to transferring to Jordan during the summer period the quantity specified in paragraphs (2.a) below from the Jordan River.
    c. In order that waste of water will be minimized, Israel and Jordan may use, downstream of point 121/Adassiya Diversion, excess flood water that is not usable and will evidently go to waste unused.
2. Water from the Jordan River
    a. Summer period - 15th May to 15th October of each year. In return for the additional water that Jordan concedes to Israel in winter in accordance with paragraph (1.b) above, Israel concedes to transfer to Jordan in the summer period (20) MCM from the Jordan River directly upstream from Deganya gates on the river. Jordan shall pay the operation and maintenance cost of such transfer through existing systems (not including capital cost) and shall bear the total cost of any new transmission system. A separate protocol shall regulate this transfer.
    b. Winter period - 16th October to 14th May of each year. Jordan is entitled to store for its use a minimum average of (20) MCM of the floods in the Jordan River south of its confluence with the Yarmouk (as outlined in Article II below). Excess floods that are not usable and that will otherwise be wasted can be utilised for the benefit of the two Parties including pumped storage off the course of the river.
    c. In addition to the above, Israel is entitled to maintain its current uses of the Jordan River waters between its confluence with the Yarmouk and its confluence with Tirat Zvi/Wadi Yabis. Jordan is entitled to an annual quantity equivalent to that of Israel, provided however, that Jordan's use will not harm the quantity or quality of the above Israeli uses. The Joint Water Committee (outlined in Article VII below) will survey existing uses for documentation and prevention of appreciable harm.
    d. Jordan is entitled to an annual quantity of (10) MCM of desalinated water from the desalination of about (20) MCM of saline springs now diverted to the Jordan River. Israel will explore the possibility of financing the operation and maintenance cost of the supply to Jordan of this desalinated water (not including capital cost). Until the desalination facilities are operational, and upon the entry into force of the Treaty,

Israel will supply Jordan (10) MCM of Jordan River water from the same location as in (2.a) above, outside the summer period and during dates Jordan selects, subject to the maximum capacity of transmission.

3. Additional Water

   Israel and Jordan shall cooperate in finding sources for the supply to Jordan of an additional quantity of (50) MCM/year of water of drinkable standards. To this end, the Joint Water Committee will develop, within one year from the entry into force of the Treaty, a plan for the supply to Jordan of the abovementioned additional water. This plan will be forwarded to the respective governments for discussion and decision.

4. Operation and Maintenance
   a. Operation and maintenance of the systems on Israeli territory that supply Jordan with water, and their electricity supply, shall be Israel's responsibility. The operation and maintenance of the new systems that serve only Jordan will be contracted at Jordan's expense to authorities or companies selected by Jordan.
   b. Israel will guarantee easy unhindered access of personnel and equipment to such new systems for operation and maintenance. This subject will be further detailed in the agreements to be signed between Israel and the authorities or companies selected by Jordan.

Article II: Storage

1. Israel and Jordan shall cooperate to build a diversion/storage dam on the Yarmouk River directly downstream of the point 121/Adassiya Diversion. The purpose is to improve the diversion efficiency into the King Abdullah Canal of the water allocation of the Hashemite Kingdom of Jordan, and possibly for the diversion of Israel's allocation of the river water. Other purposes can be mutually agreed.
2. Israel and Jordan shall cooperate to build a system of water storage on the Jordan River, along their common boundary, between its confluence with the Yarmouk River and its confluence with Tirat Zvi/ Wadi Yabis, in order to implement the provision of paragraph (2.b) of Article I above. The storage system can also be made to accommodate more floods; Israel may use up to (3) MCM/year of added storage capacity.
3. Other storage reservoirs can be discussed and agreed upon mutually.

Article III: Water Quality and Protection

1. Israel and Jordan each undertake to protect, within their own jurisdiction, the shared waters of the Jordan and Yarmouk Rivers, and Arava/Araba groundwater, against any pollution, contamination, harm or unauthorized withdrawals of each other's allocations.
2. For this purpose, Israel and Jordan will jointly monitor the quality of water along their boundary, by use of jointly established monitoring stations to be operated under the guidance of the Joint Water Committee.
3. Israel and Jordan will each prohibit the disposal of municipal and industrial wastewater into the course of the Yarmouk or the Jordan Rivers before they are treated to standards allowing their unrestricted agricultural use. Implementation of this prohibition shall be completed within three years from the entry into force of the Treaty.

4. The quality of water supplied from one country to the other at any given location shall be equivalent to the quality of the water used from the same location by the supplying country.
5. Saline springs currently diverted to the Jordan River are earmarked for desalination within four years. Both countries shall cooperate to ensure that the resulting brine will not be disposed of in the Jordan River or in any of its tributaries.
6. Israel and Jordan will each protect water systems in its own territory, supplying water to the other, against any pollution, contamination, harm or unauthorised withdrawal of each other's allocations.

Article IV: Groundwater in Emek Ha'arava/Wadi Araba

1. In accordance with the provisions of this Treaty, some wells drilled and used by Israel along with their associated systems fall on the Jordanian side of the borders. These wells and systems are under Jordan's sovereignty. Israel shall retain the use of these wells and systems in the quantity and quality detailed an Appendix to this Annex, that shall be jointly prepared by 31st December, 1994. Neither country shall take, nor cause to be taken, any measure that may appreciably reduce the yields of quality of these wells and systems.
2. Throughout the period of Israel's use of these wells and systems, replacement of any well that may fail among them shall be licensed by Jordan in accordance with the laws and regulations then in effect. For this purpose, the failed well shall be treated as though it was drilled under license from the competent Jordanian authority at the time of its drilling. Israel shall supply Jordan with the log of each of the wells and the technical information about it to be kept on record. The replacement well shall be connected to the Israeli electricity and water systems.
3. Israel may increase the abstraction rate from wells and systems in Jordan by up to (10) MCM/year above the yields referred to in paragraph 1 above, subject to a determination by the Joint Water Committee that this undertaking is hydrogeologically feasible and does not harm existing Jordanian uses. Such increase is to be carried out within five years from the entry into force of the Treaty.
4. Operation and Maintenance
    a. Operation and maintenance of the wells and systems on Jordanian territory that supply Israel with water, and their electricity supply shall be Jordan's responsibility. The operation and maintenance of these wells and systems will be contracted at Israel's expense to authorities or companies selected by Israel.
    b. Jordan will guarantee easy unhindered access of personnel and equipment to such wells and systems for operation and maintenance. This subject will be further detailed in the agreements to be signed between Jordan and the authorities or companies selected by Israel.

Article V: Notification and Agreement

1. Artificial changes in or of the course of the Jordan and Yarmouk Rivers can only be made by mutual agreement.
2. Each country undertakes to notify the other, six months ahead of time, of any intended projects which are likely to change the flow of either of the above rivers along their common boundary, or the quality of such flow. The subject will be discussed in the Joint Water Committee with the aim of preventing harm and mitigating adverse impacts such projects may cause.

Article VI: Co-operation

1. Israel and Jordan undertake to exchange relevant data on water resources through the Joint Water Committee.
2. Israel and Jordan shall co-operate in developing plans for purposes of increasing water supplies and improving water use efficiency, within the context of bilateral, regional or international cooperation.

Article VII: Joint Water Committee

1. For the purpose of the implementation of this Annex, the Parties will establish a Joint Water Committee comprised of three members from each country.
2. The Joint Water Committee will, with the approval of the respective governments, specify its work procedures, the frequency of its meetings, and the details of its scope of work. The Committee may invite experts and/or advisors as may be required.
3. The Committee may form, as it deems necessary, a number of specialized sub-committees and assign them technical tasks. In this context, it is agreed that these sub-committees will include a northern sub- committee and a southern sub-committee, for the management on the ground of the mutual water resources in these sectors.

APPENDIX-C

UN CONVENTION ON THE LAW OF THE NON-NAVIGATIONAL USES OF INTERNATIONAL WATERCOURSES

Adopted by the UN General Assembly in resolution 51/229 of 21 May 1997

(See UN Press Release on the adoption of the Convention)
(See Status of the Convention)

Official text also available in: **Arabic**, **Chinese**, **French**, **Russian**, and **Spanish**

The Parties to the present Convention,

Conscious of the importance of international watercourses and the non-navigational uses thereof in many regions of the world,

Having in mind Article 13, paragraph 1 (a), of the Charter of the United Nations, which provides that the General Assembly shall initiate studies and make recommendations for the purpose of encouraging the progressive development of international law and its codification,

Considering that successful codification and progressive development of rules of international law regarding non-navigational uses of international watercourses would assist in promoting and implementing the purposes and principles set forth in Articles 1 and 2 of the Charter of the United Nations,

Taking into account the problems affecting many international watercourses resulting from, among other things, increasing demands and pollution,

Expressing the conviction that a framework convention will ensure the utilization, development, conservation, management and protection of international watercourses and the promotion of the optimal and sustainable utilization thereof for present and future generations

Affirming the importance of international cooperation and good neighbourliness in this field,

Aware of the special situation and needs of developing countries,

Recalling the principles and recommendations adopted by the United Nations Conference on Environment and Development of 1992 in the Rio Declaration and Agenda 21,

Recalling also the existing bilateral and multilateral agreements regarding the non-navigational uses of international watercourses,

Mindful of the valuable contribution of international organizations, both governmental and non-governmental, to the codification and progressive development of international law in this field, Appreciative of the work carried out by the International Law Commission on the law of the non-navigational uses of international watercourses,

Bearing in mind United Nations General Assembly resolution 49/52 of 9 December 1994,

Have agreed as follows:

PART I. INTRODUCTION

Article 1: Scope of the present Convention

1. The present Convention applies to uses of international watercourses and of their waters for purposes other than navigation and to measures of protection, preservation and management related to the uses of those watercourses and their waters.

2. The uses of international watercourses for navigation is not within the scope of the present Convention except insofar as other uses affect navigation or are affected by navigation.

Article 2: Use of Terms

For the purposes of the present Convention:

(a) "Watercourse" means a system of surface waters and groundwaters constituting by virtue of their physical relationship a unitary whole and normally flowing into a common terminus;

(b) "International watercourse" means a watercourse, parts of which are situated in different States;

(c) "Watercourse State" means a State Party to the present Convention in whose territory part of an international watercourse is situated, or a Party that is a regional economic integration organization, in the territory of one or more of whose Member States part of an international watercourse is situated;

(d) "Regional economic integration organization" means an organization constituted by sovereign States of a given region, to which its member States have transferred competence in respect of matters governed by this Convention and which has been duly authorized in accordance with its internal procedures, to sign, ratify, accept, approve or accede to it.

Article 3: Watercourse Agreements

1. In the absence of an agreement to the contrary, nothing in the present Convention shall affect the rights or obligations of a watercourse State arising from agreements in force for it on the date on which it became a party to the present Convention.

2. Notwithstanding the provisions of paragraph 1, parties to agreements referred to in paragraph 1 may, where necessary, consider harmonizing such agreements with the basic principles of the present Convention.

3. Watercourse States may enter into one or more agreements, hereinafter referred to as "watercourse agreements", which apply and adjust the provisions of

the present Convention to the characteristics and uses of a particular international watercourse or part thereof.

4. Where a watercourse agreement is concluded between two or more watercourse States, it shall define the waters to which it applies. Such an agreement may be entered into with respect to an entire international watercourse or any part thereof or a particular project programme or use except insofar as the agreement adversely affects, to a significant extent, the use by one or more other watercourse States of the waters of the watercourse, without their express consent.

5. Where a watercourse State considers that adjustment and application of the provisions of the present Convention is required because of the characteristics and uses of a particular international watercourse, watercourse States shall consult with a view to negotiating in good faith for the purpose of concluding a watercourse agreement or agreements.

6. Where some but not all watercourse States to a particular international watercourse are parties to an agreement, nothing in such agreement shall affect the rights or obligations under the present Convention of watercourse States that are not parties to such an agreement.

Article 4: Parties to Watercourse Agreements

1. Every watercourse State is entitled to participate in the negotiation of and to become a party to any watercourse agreement that applies to the entire international watercourse, as well as to participate in any relevant consultations.

2. A watercourse State whose use of an international watercourse may be affected to a significant extent by the implementation of a proposed watercourse agreement that applies only to a part of the watercourse or to a particular project, programme or use is entitled to participate in consultations on such an agreement and, where appropriate, in the negotiation thereof in good faith with a view to becoming a party thereto, to the extent that its use is thereby affected.

PART II. GENERAL PRINCIPLES

Article 5: Equitable and Reasonable Utilization and Participation

1. Watercourse States shall in their respective territories utilize an international watercourse in an equitable and reasonable manner. In particular, an international watercourse shall be used and developed by watercourse States with a view to attaining optimal and sustainable utilization thereof and benefits there from., taking into account the interests of the watercourse States concerned, consistent with adequate protection of the watercourse.

2. Watercourse States shall participate in the use, development and protection of an international watercourse in an equitable and reasonable manner. Such participation includes both the right to utilize the watercourse and the duty to cooperate in the protection and development thereof, as provided in the present Convention.

Article 6: Factors Relevant to Equitable and Reasonable Utilization

1. Utilization of an international watercourse in an equitable and reasonable manner within the meaning of article 5 requires taking into account all relevant factors and circumstances, including:

(a) Geographic, hydrographic, hydrological, climatic, ecological and other factors of a natural character;

(b) The social and economic needs of the watercourse States concerned;

(c) The population dependent on the watercourse in each watercourse State;

(d) The effects of the use or uses of the watercourses in one watercourse State on other watercourse States;

(e) Existing and potential uses of the watercourse;

(f) Conservation, protection, development and economy of use of the water resources of the watercourse and the costs of measures taken to that effect;

(g) The availability of alternatives, of comparable value, to a particular planned or existing use.

2. In the application of article 5 or paragraph 1 of this article, watercourse States concerned shall, when the need arises, enter into consultations in a spirit of cooperation.

3. The weight to be given to each factor is to be determined by its importance in comparison with that of other relevant factors. In determining what is a reasonable and equitable use, all relevant factors are to be considered together and a conclusion reached on the basis of the whole.

Article 7: Obligation Not to Cause Significant Harm

1. Watercourse States shall, in utilizing an international watercourse in their territories, take all appropriate measures to prevent the causing of significant harm to other watercourse States.

2. Where significant harm nevertheless is caused to another watercourse State, the States whose use causes such harm shall, in the absence of agreement to such use, take all appropriate measures, having due regard for the provisions of articles 5 and 6, in consultation with the affected State, to eliminate or mitigate such harm and, where appropriate, to discuss the question of compensation.

Article 8: General Obligation to Cooperate

1. Watercourse States shall cooperate on the basis of sovereign equality, territorial integrity, mutual benefit and good faith in order to attain optimal utilization and adequate protection of an international watercourse.

2. In determining the manner of such cooperation, watercourse States may consider the establishment of joint mechanisms or commissions, as deemed necessary by them, to facilitate cooperation on relevant measures and procedures in the light of experience gained through cooperation in existing joint mechanisms and commissions in various regions.

Article 9: Regular Exchange of Data and Information

1. Pursuant to article 8, watercourse States shall on a regular basis exchange readily available data and information on the condition of the watercourse, in particular that of a hydrological, meteorological, hydrogeological and ecological nature and related to the water quality as well as related forecasts.

2. If a watercourse State is requested by another watercourse State to provide data or information that is not readily available, it shall employ its best efforts to comply with the request but may condition its compliance upon payment by the requesting State of the reasonable costs of collecting and, where appropriate, processing such data or information.

3. Watercourse States shall employ their best efforts to collect and, where appropriate, to process data and information in a manner which facilitates its utilization by the other watercourse States to which it is communicated.

Article 10: Relationship Between Different Kinds of Uses

1. In the absence of agreement or custom to the contrary, no use of an international watercourse enjoys inherent priority over other uses.

2. In the event of a conflict between uses of an international watercourse, it shall be resolved with reference to articles 5 to 7, with special regard being given to the requirements of vital human needs.

PART III. PLANNED MEASURES

Article 11: Information Concerning Planned Measures

Watercourse States shall exchange information and consult each other and, if necessary, negotiate on the possible effects of planned measures on the condition of an international watercourse.

Article 12: Notification Concerning Planned Measures with Possible Adverse Effects

Before a watercourse State implements or permits the implementation of planned measures which may have a significant adverse effect upon other watercourse States, it shall provide those States with timely notification thereof. Such notification shall be accompanied by available technical data and information, including the results of any environmental impact assessment, in order to enable the notified States to evaluate the possible effects of the planned measures.

Article 13: Period for Reply to Notification

Unless otherwise agreed:

(a) A watercourse State providing a notification under article 12 shall allow the notified States a period of six months within which to study and evaluate the possible effects of the planned measures and to communicate the findings to it;

(b) This period shall, at the request of a notified State for which the evaluation of the planned measures poses special difficulty, be extended for a period of six months.

Article 14: Obligations of the Notifying State During the Period for Reply

During the period referred to in article 13, the notifying State:

(a) Shall cooperate with the notified States by providing them, on request, with any additional data and information that is available and necessary for an accurate evaluation; and

(b) Shall not implement or permit the implementation of the planned measures without the consent of the notified States.

Article 15: Reply to Notification

The notified States shall communicate their findings to the notifying State as early as possible within the period applicable pursuant to article 13. If a notified State finds that implementation of the planned measures would be inconsistent with the provisions of articles 5 or 7, it shall attach to its finding a documented explanation setting forth the reasons for the finding.

Article 16: Absence of Reply to Notification

1. If, within the period applicable pursuant to article 13, the notifying State receives no communication under article 15, it may, subject to its obligations under articles 5 and 7, proceed with the implementation of the planned measures, in accordance with the notification and any other data and information provided to the notified States.

2. Any claim to compensation by a notified State which has failed to reply within the period applicable pursuant to article 13 may be offset by the costs incurred by the notifying State for action undertaken after the expiration of the time for a reply which would not have been undertaken if the notified State had objected within that period.

Article 17: Consultations and Negotiations Concerning Planned Measures

1. If a communication is made under article 15 that implementation of the planned measures would be inconsistent with the provisions of articles 5 or 7, the notifying State and the State making the communication shall enter into consultations and, if necessary, negotiations with a view to arriving at an equitable resolution of the situation.

2. The consultations and negotiations shall be conducted on the basis that each State must in good faith pay reasonable regard to the rights and legitimate interests of the other State.

3. During the course of the consultations and negotiations, the notifying State shall, if so requested by the notified State at the time it makes the communication, refrain from implementing or permitting the implementation of the planned measures for a period of six months unless otherwise agreed.

Article 18: Procedures in the Absence of Notification

1. If a watercourse State has reasonable grounds to believe that another watercourse State is planning measures that may have a significant adverse effect upon it, the former State may request the latter to apply the provisions of article 12.

The request shall be accompanied by a documented explanation setting forth its grounds.

2. In the event that the State planning the measures nevertheless finds that it is not under an obligation to provide a notification under article 12, it shall so inform the other State, providing a documented explanation setting forth the reasons for such finding. If this finding does not satisfy the other State, the two States shall, at the request of that other State, promptly enter into consultations and negotiations in the manner indicated in paragraphs 1 and 2 of article 17.

3. During the course of the consultations and negotiations, the State planning the measures shall, if so requested by the other State at the time it requests the initiation of consultations and negotiations, refrain from implementing or permitting the implementation of those measures for a period of six months unless otherwise agreed.

Article 19: Urgent Implementation of Planned Measures

1. In the event that the implementation of planned measures is of the utmost urgency in order to protect public health, public safety or other equally important interests, the State planning the measures may, subject to articles 5 and 7, immediately proceed to implementation, notwithstanding the provisions of article 14 and paragraph 3 of article 17.

2. In such case, a formal declaration of the urgency of the measures shall be communicated without delay to the other watercourse States referred to in article 12 together with the relevant data and information.

3. The State planning the measures shall, at the request of any of the States referred to in paragraph 2, promptly enter into consultations and negotiations with it in the manner indicated in paragraphs 1 and 2 of article 17.

PART IV. PROTECTION, PRESERVATION AND MANAGEMENT

Article 20: Protection and Preservation of Ecosystems

Watercourse States shall, individually and, where appropriate, jointly, protect and preserve the ecosystems of international watercourses.

Article 21: Prevention, Reduction and Control of Pollution

1. For the purpose of this article, "pollution of an international watercourse" means any detrimental alteration in the composition or quality of the waters of an international watercourse which results directly or indirectly from human conduct.

2. Watercourse States shall, individually and, where appropriate, jointly, prevent, reduce and control the pollution of an international watercourse that may cause significant harm to other watercourse States or to their environment, including harm to human health or safety, to the use of the waters for any beneficial purpose or to the living resources of the watercourse. Watercourse States shall take steps to harmonize their policies in this connection.

3. Watercourse States shall, at the request of any of them, consult with a view to arriving at mutually agreeable measures and methods to prevent, reduce and control pollution of an international watercourse, such as:

(a) Setting joint water quality objectives and criteria;

(b) Establishing techniques and practices to address pollution from point and non-point sources;

(c) Establishing lists of substances the introduction of which into the waters of an international watercourse is to be prohibited, limited, investigated or monitored.

Article 22: Introduction of Alien or New Species

Watercourse States shall take all measures necessary to prevent the introduction of species, alien or new, into an international watercourse which may have effects detrimental to the ecosystem of the watercourse resulting in significant harm to other watercourse States.

Article 23: Protection and Preservation of the Marine Environment

Watercourse States shall, individually and, where appropriate, in cooperation with other States, take all measures with respect to an international watercourse that are necessary to protect and preserve the marine environment, including estuaries, taking into account generally accepted international rules and standards.

Article 24: Management

1. Watercourse States shall, at the request of any of them, enter into consultations concerning the management of an international watercourse, which may include the establishment of a joint management mechanism.

2. For the purposes of this article, "management" refers, in particular, to:

(a) Planning the sustainable development of an international watercourse and providing for the implementation of any plans adopted; and

(b) Otherwise promoting the rational and optimal utilization, protection and control of the watercourse.

Article 25: Regulation

1. Watercourse States shall cooperate, where appropriate, to respond to needs or opportunities for regulation of the flow of the waters of an international watercourse.

2. Unless otherwise agreed, watercourse States shall participate on an equitable basis in the construction and maintenance or defrayal of the costs of such regulation works as they may have agreed to undertake.

3. For the purposes of this article, "regulation" means the use of hydraulic works or any other continuing measure to alter, vary or otherwise control the flow of the waters of an international watercourse.

Article 26: Installations

1. Watercourse States shall, within their respective territories, employ their best efforts to maintain and protect installations, facilities and other works related to an international watercourse.

2. Watercourse States shall, at the request of any of them which has reasonable grounds to believe that it may suffer significant adverse effects, enter into consultations with regard to:

(a) The safe operation and maintenance of installations, facilities or other works related to an international watercourse; and

(b) The protection of installations, facilities or other works from willful or negligent acts or the forces of nature.

PART V. HARMFUL CONDITIONS AND EMERGENCY SITUATIONS

Article 27: Prevention and mitigation of harmful conditions

Watercourse States shall, individually and, where appropriate, jointly, take all appropriate measures to prevent or mitigate conditions related to an international watercourse that may be harmful to other watercourse States, whether resulting from natural causes or human conduct, such as flood or ice conditions, water-borne diseases, siltation, erosion, salt-water intrusion, drought or desertification.

Article 28: Emergency situations

1. For the purposes of this article, "emergency" means a situation that causes, or poses an imminent threat of causing, serious harm to watercourse States or other States and that results suddenly from natural causes, such as floods, the breaking up of ice, landslides or earthquakes, or from human conduct, such as industrial accidents.

2. A watercourse State shall, without delay and by the most expeditious means available, notify other potentially affected States and competent international organizations of any emergency originating within its territory.

3. A watercourse State within whose territory an emergency originates shall, in cooperation with potentially affected States and, where appropriate, competent international organizations, immediately take all practicable measures necessitated by the circumstances to prevent, mitigate and eliminate harmful effects of the emergency.

4. When necessary, watercourse States shall jointly develop contingency plans for responding to emergencies, in cooperation, where appropriate, with other potentially affected States and competent international organizations.

PART VI. MISCELLANEOUS PROVISIONS

Article 29: International watercourses and installations in time of armed conflict

International watercourses and related installations, facilities and other works shall enjoy the protection accorded by the principles and rules of international law applicable in international and non-international armed conflict and shall not be used in violation of those principles and rules.

Article 30: Indirect Procedures

In cases where there are serious obstacles to direct contacts between watercourse States, the States concerned shall fulfill their obligations of cooperation provided for in the present Convention, including exchange of data and information, notification, communication, consultations and negotiations, through any indirect procedure accepted by them.

Article 31: Data and Information Vital to National Defence or Security

Nothing in the present Convention obliges a watercourse State to provide data or information vital to its national defence or security. Nevertheless, that State shall cooperate in good faith with the other watercourse States with a view to providing as much information as possible under the circumstances

Article 32: Non-discrimination

Unless the watercourse States concerned have agreed otherwise for the protection of the interests of persons, natural or juridical, who have suffered or are under a serious threat of suffering significant transboundary harm as a result of activities related to an international watercourse, a watercourse State shall not discriminate on the basis of nationality or residence or place where the injury occurred, in granting to such persons, in accordance with its legal system, access to judicial or other procedures, or a right to claim compensation or other relief in respect of significant harm caused by such activities carried on in its territory.

Article 33: Settlement of disputes

1. In the event of a dispute between two or more Parties concerning the interpretation or application of the present Convention, the Parties concerned shall, in the absence of an applicable agreement between them, seek a settlement of the dispute by peaceful means in accordance with the following provisions.

2. If the Parties concerned cannot reach agreement by negotiation requested by one of them, they may jointly seek the good offices of, or request mediation or conciliation by, a third party, or make use, as appropriate, of any joint watercourse institutions that may have been established by them or agree to submit the dispute to arbitration or to the International Court of Justice.

3. Subject to the operation of paragraph 10, if after six months from the time of the request for negotiations referred to in paragraph 2, the Parties concerned have not been able to settle their dispute through negotiation or any other means referred to in paragraph 2, the dispute shall be submitted, at the request of any of the parties to the dispute, to impartial fact-finding in accordance with paragraphs 4 to 9, unless the Parties otherwise agree.

4. Fact-finding Commission shall be established, composed of one member nominated by each Party concerned and in addition a member not having the nationality of any of the Parties concerned chosen by the nominated members who shall serve as Chairman.

5. If the members nominated by the Parties are unable to agree on a Chairman within three months of the request for the establishment of the Commission, any Party concerned may request the Secretary-General of the United Nations to appoint the Chairman who shall not have the nationality of any of the parties to the dispute or of any riparian State of the watercourse concerned. If one of the Parties fails to nominate a member within three months of the initial request pursuant to paragraph 3, any other Party concerned may request the Secretary-General of the

United Nations to appoint a person who shall not have the nationality of any of the parties to the dispute or of any riparian State of the watercourse concerned. The person so appointed shall constitute a single-member Commission.

6. The Commission shall determine its own procedure.

7. The Parties concerned have the obligation to provide the Commission with such information as it may require and, on request, to permit the Commission to have access to their respective territory and to inspect any facilities, plant, equipment, construction or natural feature relevant for the purpose of its inquiry.

8. The Commission shall adopt its report by a majority vote, unless it is a single-member Commission, and shall submit that report to the Parties concerned setting forth its findings and the reasons therefore and such recommendations as it deems appropriate for an equitable solution of the dispute, which the Parties concerned shall consider in good faith.

9. The expenses of the Commission shall be borne equally by the Parties concerned

10. When ratifying, accepting, approving or acceding to the present Convention, or at any time thereafter, a Party which is not a regional economic integration organization may declare in a written instrument submitted to the Depositary that, in respect of any dispute not resolved in accordance with paragraph 2, it recognizes as compulsory ipso facto and without special agreement in relation to any Party accepting the same obligation:

(a) Submission of the dispute to the International Court of Justice; and/or

(b) Arbitration by an arbitral tribunal established and operating, 'unless the parties to the dispute otherwise agreed, in accordance with the procedure laid down in the annex to the present Convention.

A Party which is a regional economic integration organization may make a declaration with like effect in relation to arbitration in accordance with subparagraph (b).

PART VII. FINAL CLAUSES

Article 34: Signature

The present Convention shall be open for signature by all States and by regional economic integration organizations from 21 May 1997 until 20 May 2000 at United Nations Headquarters in New York.

Article 35: Ratification, Acceptance, Approval or Accession

1. The present Convention is subject to ratification, acceptance, approval or accession by States and by regional economic integration organizations. The instruments of ratification, acceptance, approval or accession shall be deposited with the Secretary-General of the United Nations.

2. Any regional economic integration organization which becomes a Party to this Convention without any of its member States being a Party shall be bound by all the obligations under the Convention. In the case of such organizations, one or more of whose member States is a Party to this Convention, the organization and

its member States shall decide on their respective responsibilities for the performance of their obligations under the Convention. In such cases, the organization and the member States shall not be entitled to exercise rights under the Convention concurrently.

3. In their instruments of ratification, acceptance, approval or accession, the regional economic integration organizations shall declare the extent of their competence with respect to the matters governed by the Convention. These organizations shall also inform the Secretary-General of the United Nations of any substantial modification in the extent of their competence.

Article 36: Entry into Force

1. The present Convention shall enter into force on the ninetieth day following the date of deposit of the thirty-fifth instrument of ratification, acceptance, approval or accession with the Secretary-General of the United Nations.

2. For each State or regional economic integration organization that ratifies, accepts or approves the Convention or accedes thereto after the deposit of the thirty-fifth instrument of ratification, acceptance, approval or accession, the Convention shall enter into force on the ninetieth day after the deposit by such State or regional economic integration organization of its instrument of ratification, acceptance, approval or accession.

3. For the purposes of paragraphs 1 and 2, any instrument deposited by a regional economic integration organization shall not be counted as additional those deposited by States.

Article 37: Authentic Texts

The original of the present Convention, of which the Arabic, Chinese, English, French, Russian and Spanish texts are equally authentic, shall be deposited with the Secretary-General of the United Nations.

IN WITNESS WHEREOF the undersigned plenipotentiaries, being duly authorized thereto, have signed this Convention.

DONE at New York, this day of one thousand nine hundred and ninety-seven.

ANNEX

ARBITRATION

Article 1

Unless the parties to the dispute otherwise agree, the arbitration pursuant to article 33 of the Convention shall take place in accordance with articles 2 to 14 of the present annex.

Article 2

The claimant party shall notify the respondent party that it is referring a dispute to arbitration pursuant to article 33 of the Convention. The notification shall state the subject matter of arbitration and include, in particular, the articles of the Convention, the interpretation or application of which are at issue. If the parties do not agree on the subject matter of the dispute, the arbitral tribunal shall determine the subject matter.

Article 3

1. In disputes between two parties, the arbitral tribunal shall consist of three members. Each of the parties to the dispute shall appoint an arbitrator and the two arbitrators so appointed shall designate by common agreement the third arbitrator, who shall be the Chairman of the tribunal. The latter shall not' be a national of one of the parties to the dispute or of any riparian State of the watercourse concerned, nor have his or her usual place of residence in the territory of one of these parties or such riparian State, nor have dealt with the case in any other capacity.

2. In disputes between more than two parties, parties in the same interest shall appoint one arbitrator jointly by agreement.

3. Any vacancy shall be filled in the manner prescribed for the initial appointment.

Article 4

1. If the Chairman of the arbitral tribunal has not been designated within two months of the appointment of the second arbitrator, the President of the International Court of Justice shall, at the request of a party, designate the Chairman within a further two-month period.

2. If one of the parties to the dispute does not appoint an arbitrator within two months of receipt of the request, the other party may inform the President of the International Court of Justice, who shall make the designation within a further two-month period.

Article 5

The arbitral tribunal shall render its decisions in accordance with the provisions of this Convention and international law.

Article 6

Unless the parties to the dispute otherwise agree, the arbitral tribunal shall determine its own rules of procedure.

Article 7

The arbitral tribunal may, at the request of one of the Parties, recommend essential interim measures of protection.

Article 8

1. The parties to the dispute shall facilitate the work of the arbitral tribunal and, in particular, using all means at their disposal, shall:

(a) Provide it with all relevant documents, information and facilities; and

(b) Enable it', when necessary, to call witnesses or experts and receive their evidence.

2. The parties and the arbitrators are under an obligation to protect the confidentiality of any information they receive in confidence during the proceedings of the arbitral tribunal.

Article 9

Unless the arbitral tribunal determines otherwise because of the particular circumstances of the case, the costs of the tribunal shall be borne by the parties to the dispute in equal shares. The tribunal shall keep a record of all its costs, and shall furnish a final statement thereof to the parties.

Article 10

Any Party that has an interest of a legal nature in the subject matter of the dispute which may be affected by the decision in the case, may intervene in the proceedings with the consent of the tribunal.

Article 11

The tribunal may hear and determine counterclaims arising directly out of the subject matter of the dispute.

Article 12

Decisions both on procedure and substance of the arbitral tribunal shall be taken by a majority vote of its members.

Article 13

If one of the parties to the dispute does not appear before the arbitral tribunal or fails to defend its case, the other party may request the tribunal to continue the proceedings and to make its award. Absence of a party or a failure of a party to defend its case shall not constitute a bar to the proceedings. Before rendering its final decision, the arbitral tribunal must satisfy itself that the claim is well founded in fact and law.

Article 14

1. The tribunal shall render its final decision within five months of the date on which it is fully constituted unless it finds it necessary to extend the time limit for a period which should not exceed five more months.

2. The final decision of the arbitral tribunal shall be confined to the subject matter of the dispute and shall state the reasons on which it is based'. It shall contain the names of the members who have participated and the date of the final decision. Any member of the tribunal may attach a separate or dissenting opinion to the final decision.

3. The award shall be binding on the parties to the dispute. It shall be without appeal unless the parties to the dispute have agreed in advance to an appellate procedure.

4. Any controversy which may arise between the parties to the dispute as regards the interpretation or manner of implementation of the final decision may be submitted by either party for decision to the arbitral tribunal which rendered it.

APPENDIX-D

ARCHIVAL MATERIAL

Public Record Office, London

The classes and series listed below are those that contain documents of direct relevance to the Nile issue. The given covering data are in general adapted to the topic of the book (e.g. 1912-89 will be 1912-56).

CAB 37: Cabinet Office: Photographic Copies of Cabinet Papers. 1880-1916. Consists of a collection of photographic copies of memoranda circulated to the Cabinet to the end of 1916. 162 volumes. Some of the documents deal with the Sudan issue.

Archives at Windsor, written by prime Ministers to the Sovereign to report proceedings at Cabinet Meetings. Relevant subject headings: Abyssinia, Sudan, Egypt and Uganda.

CAB 78: Consists of minutes and papers of various Cabinet committees in the Miscellaneous and General Series. 1941-47. 39 volumes. Includes subject headings on policies in regard to Ethiopia, Egypt and the Middle East in general.

CAB 128: Cabinet meetings. Consists of minutes and papers of a variety of committees and sub- committees on the Middle East and Africa. 1939-45. 49 files, microforms and volumes. Deals with the Middle East, Egypt and the Sudan.

CO 537: Colonial Office and predecessors: Confidential General and Condential Original Correspondence. 1945-56. Sub- series on Uganda. This also contains documents related to Lake Albert and Lake Victoria in the late 1940s.

FO 78: Foreign office and predecessors: Political and Other Departments: General Correspondence before 1906. 1780-1905. 5491 volumes. Contains general correspondence relating to the Ottoman Empire.

FO 115: Records of the British Embassy in Washington

FO 141: Foreign Office and Foreign and Commonwealth Office: Embassy and Consulates, Egypt: General Correspondence. 1815-1971. 1482 volumes. Contains general correspondence of the British Embassy and consulates in Egypt. Papers dealing with British and American policies in the Middle East. Correspondence described in the register.

FO 368: Foreign Office, General Commercial Correspondence. 1906-19. Includes correspondence on Abyssinia, Egypt and the Sudan for all the years.

FO369 Foreign Office: Consular Department. Includes general correspondence from 1906 on Egypt, Ethiopia and the Sudan for all relevant years.

FO371: Foreign Office: Political Departments: General correspondence 1906-66. Sub-series on Egypt, Sudan and Ethiopia. A very rich collection of relevant sources. Separate index to general correspondence for all the relevant years. Documents under the following headings: Egypt, Sudan, Abyssinia/ Ethiopia, Irrigation, Tsana, Jonglei, Nile projects, Aswan

FO407: Confidential Print Egypt and the Sudan. 1839-1958.237 volumes. Organised chronologically.

FO633. Cromer's correspondence.113 files and volumes. This series contains private and official correspondence and papers of Evelllyn Baring, 1st Earl of Cromer, mainly dealing with his career as Commissioner of the Egyptian public Debt and later Minister plenipotentiary in Egypt (18883-1907). Organized chronologically. Details of correspondence explained in the register. Contains a great number of letters dealing with irrigation, dams and Nile control.

FO800: Foreign Office, Private Offices: Various Ministries' and Officials' Papers. 1824-1968. 986 volumes. Consists of the Private Office papers of most Secretaries of State 1900-56 and of many Under-Secretaries of State from 1886 to 1948(Belvin, Curzon, Eden, Eric Drummond, Selwyn Lloyd and Roger Makins). Many of the files deal with Egypt, Abyssinia and thus the Nile issue.

FO921: War Cabinet: Office of the Minister of State Resident in the Middle East: Registered files. 1942-46. 384 files. Contains sources from the Office of the Minister of State, Resident in Cairo. He had Cabinet rank and his main function was operations in the Middle East. Sub-series on Ethiopia, Egypt, North Africa General, Cairo Conference.

FO954: Foreign Office: Private Office Papers of Sir Anthony Eden. Photocopies of private office papers of Anthony Eden as secretary of State for Foreign Affairs 1936-38 and 1940-45. Few papers from 1935 and 1946. 34 volumes.

PREM8: Prime Ministers' Office: Correspondence and papers, 1945-51. The records in this series cover Attlee's Labour administration of 1945-51.

PREM 11: Prime Ministers' Office: Correspondence and papers, 1951-64. Contains the general correspondence and papers of the conservative administration 1951-54.

PRO 30/57: Kitchener papers. Within the first category of this huge collection of private papers there are many papers that deal with the conquest of the Sudan and the High Commissionership in Egypt.

Arab Leage, Technical Committee, The Arab Plan for the Development of water Resources in the Jordan Valley (Cairo: March, 1954).

Great Britain, British and Foreign State Papers. Vols. 56, 108.

Palestine Partition Commission Report. Cmd. 5854 (1938).

Report of His Majesty's Government in the United Kingdom of Great Britain and Northern Ireland to the Council of the League of Nations on the Administration of Palestine and Transjordan (1936-1939).

The Unified Development of the Water Resources of the Jordan Valley Region (Prepared for UNRWA by charles T. Main, Inc.), 1953.

United Nations Treaty Series, Vols. 3, 5, 23, 27, 49, 54, 109, 184.

United Nation Treaty Series, Nos. 455 and 548.

Abate, Zewdie. 1992. observed context of environment and development in Ethiopia: An approach that needs development. Occasional paper No.7. London: School of African and Oriental Studies, Centre of Middle Eastern Studies.

Abate, Z. (1990). "The Integrated Development of the Nile Basin Waters," in The Nile, P.P. Howell and J.A.Allan (eds.). London: SOAS, 137-152.

Ahmed, S. (1990). "Context and Precedents with Respect of the Development, Division and Management of Nile Water," in The London: SOAS, 225-238.

Allan,J.A.(1989)."Natural Resource: Not So Natural for Ease of Development," in Libya: State and Regional, J.A.Allan et al. (eds.) London: SOAS, 63-72